TECHNOLOGY DEPT.

Gas Journal

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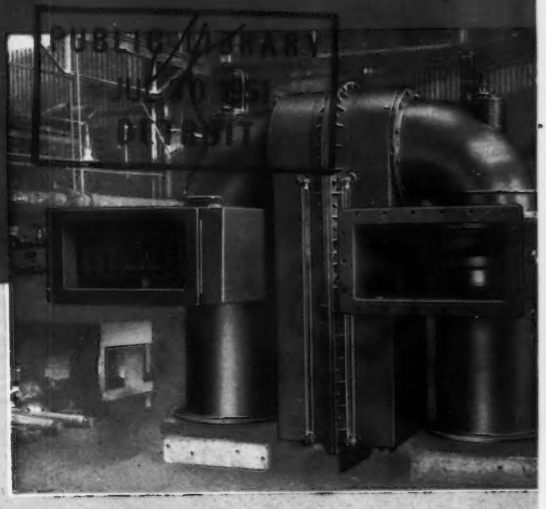

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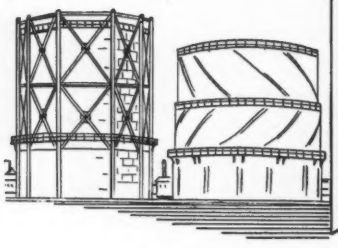

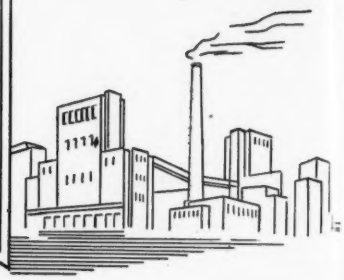

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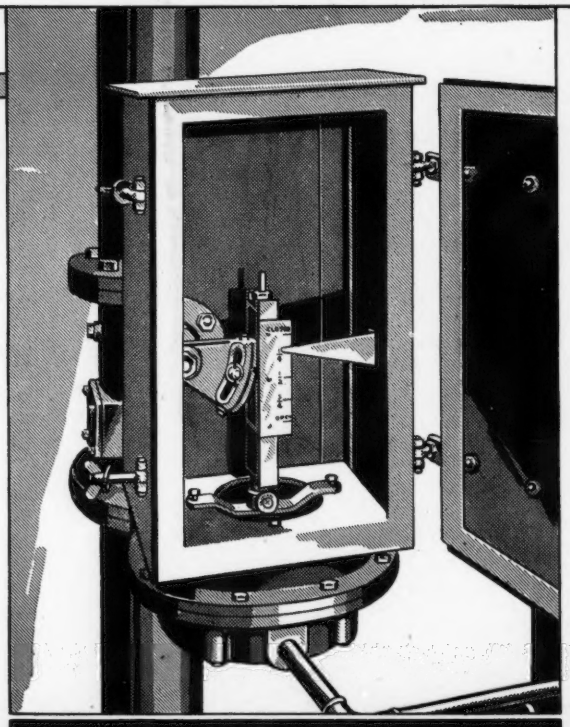

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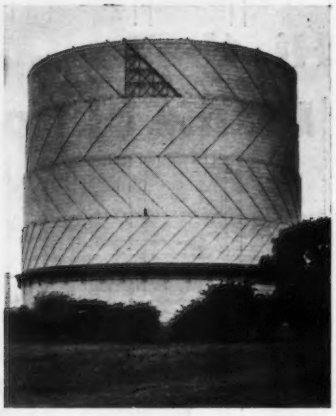

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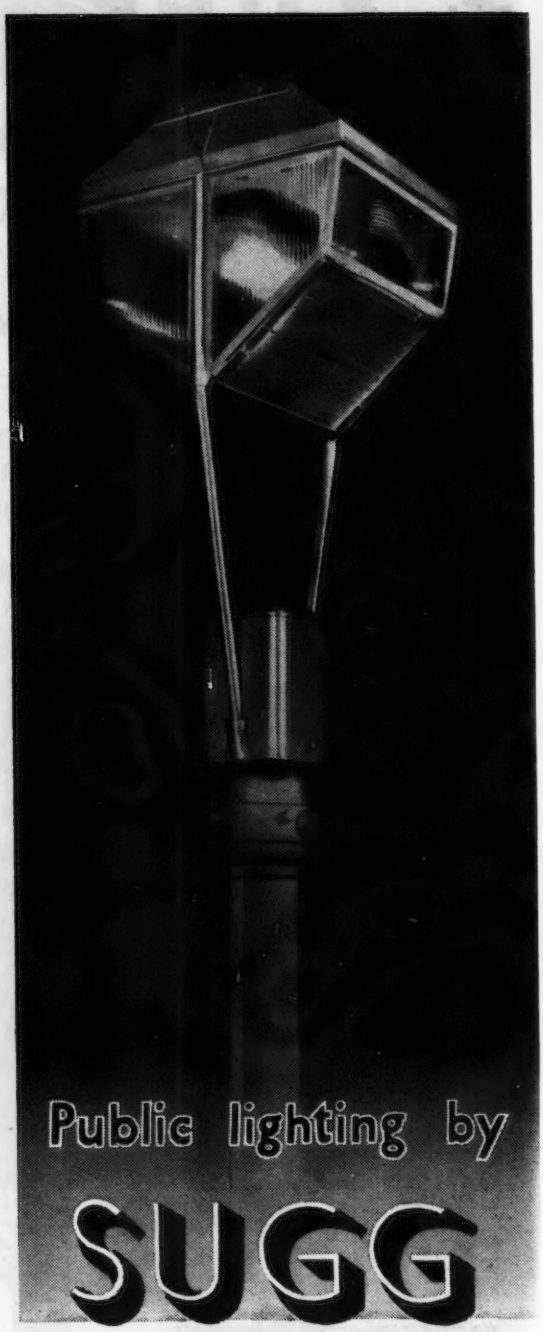

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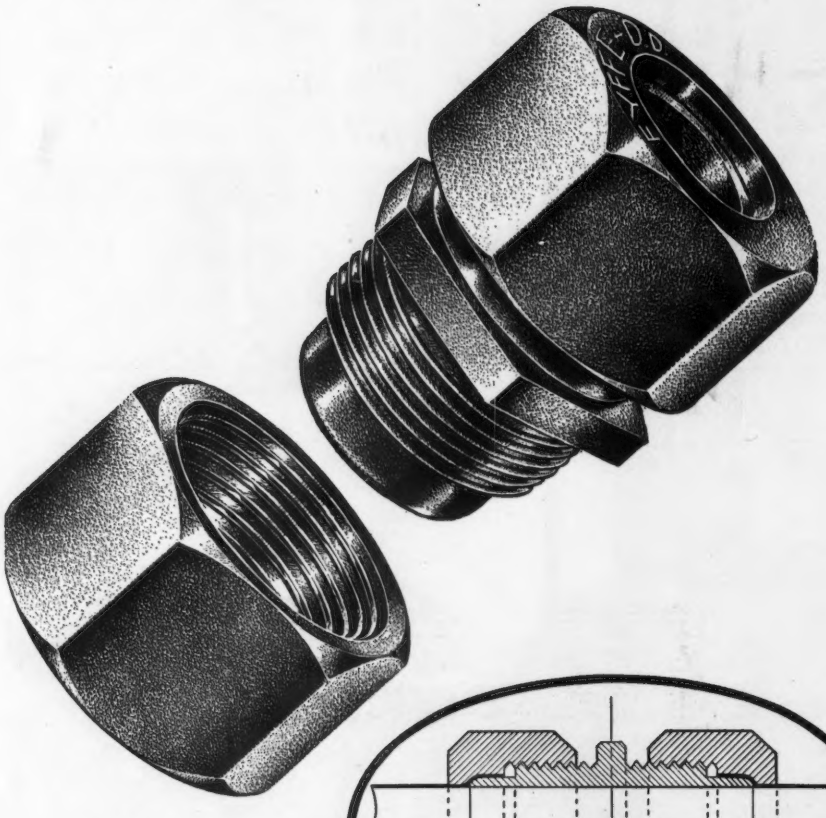
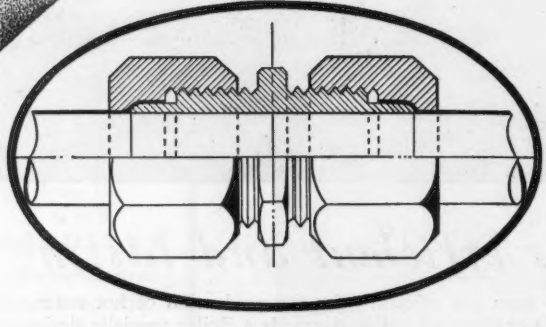


'D.D.'



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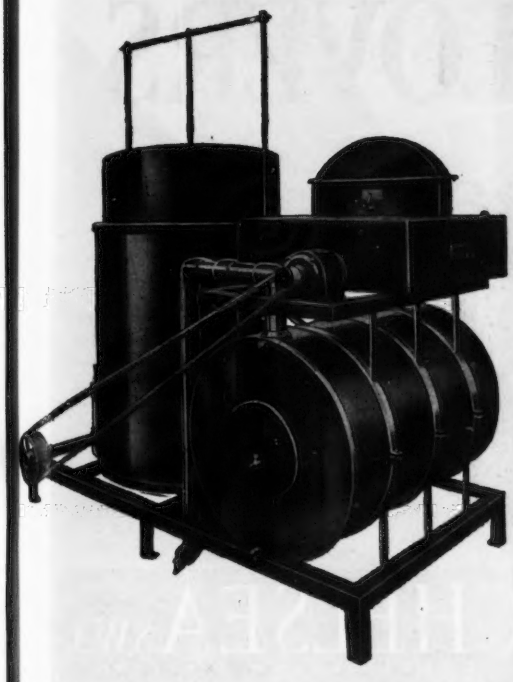

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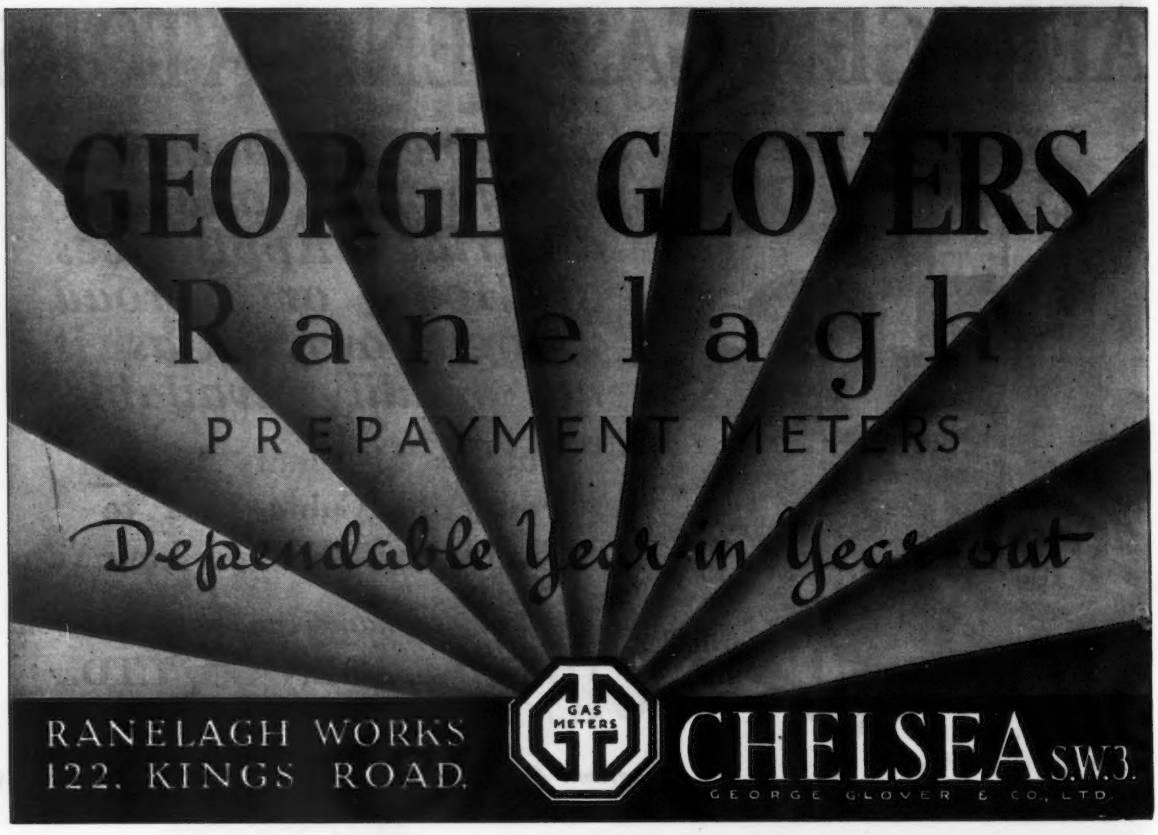

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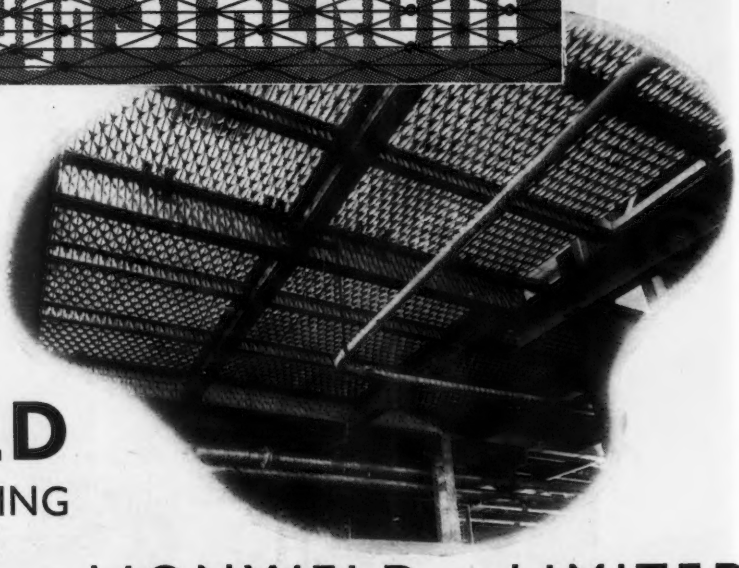
"and the strength is in the weld"



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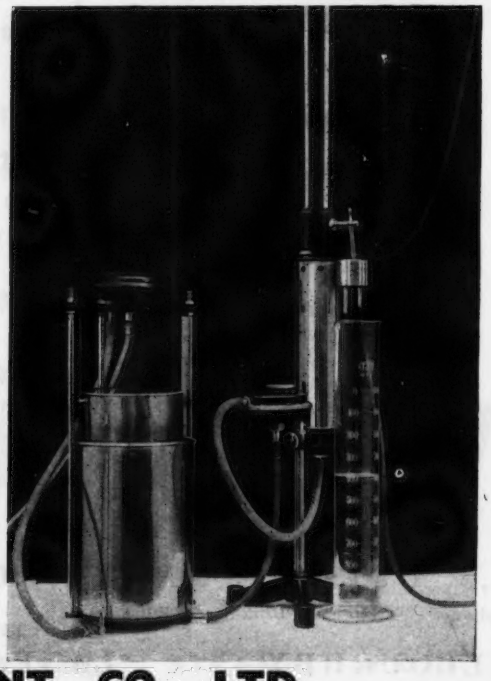

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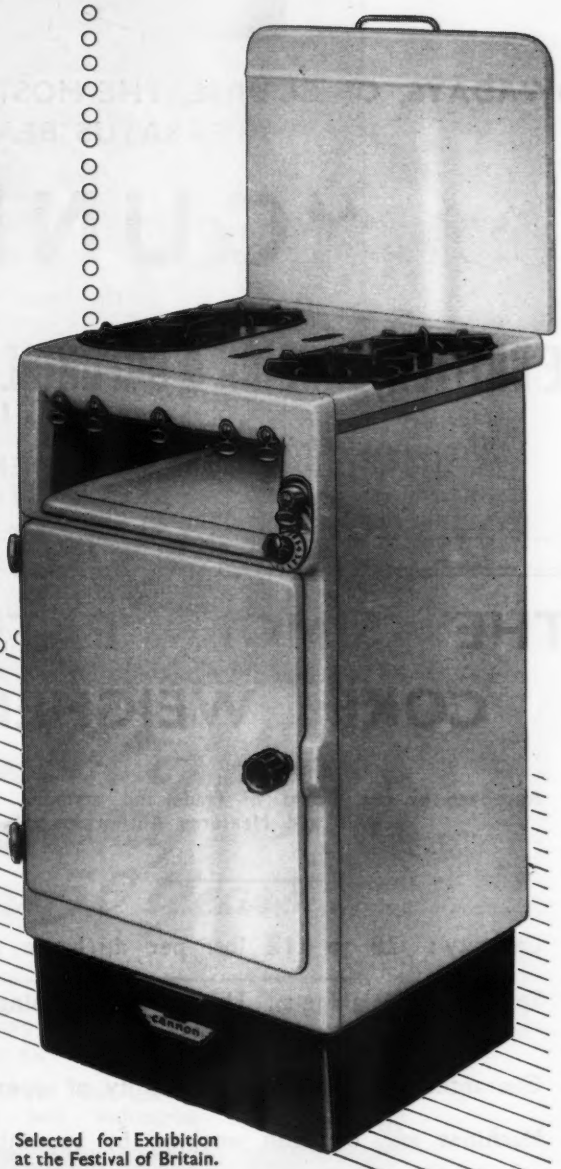

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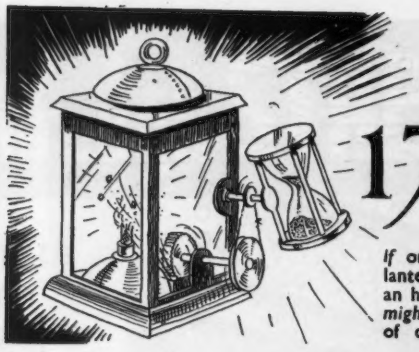

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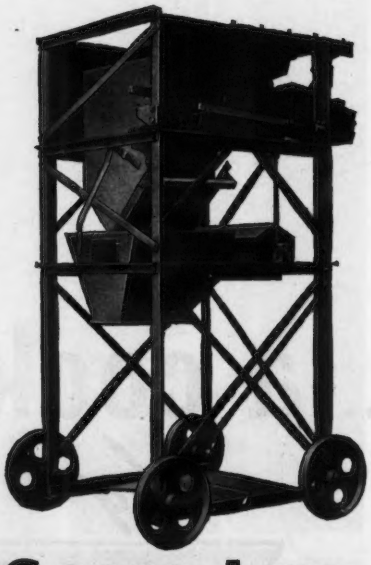

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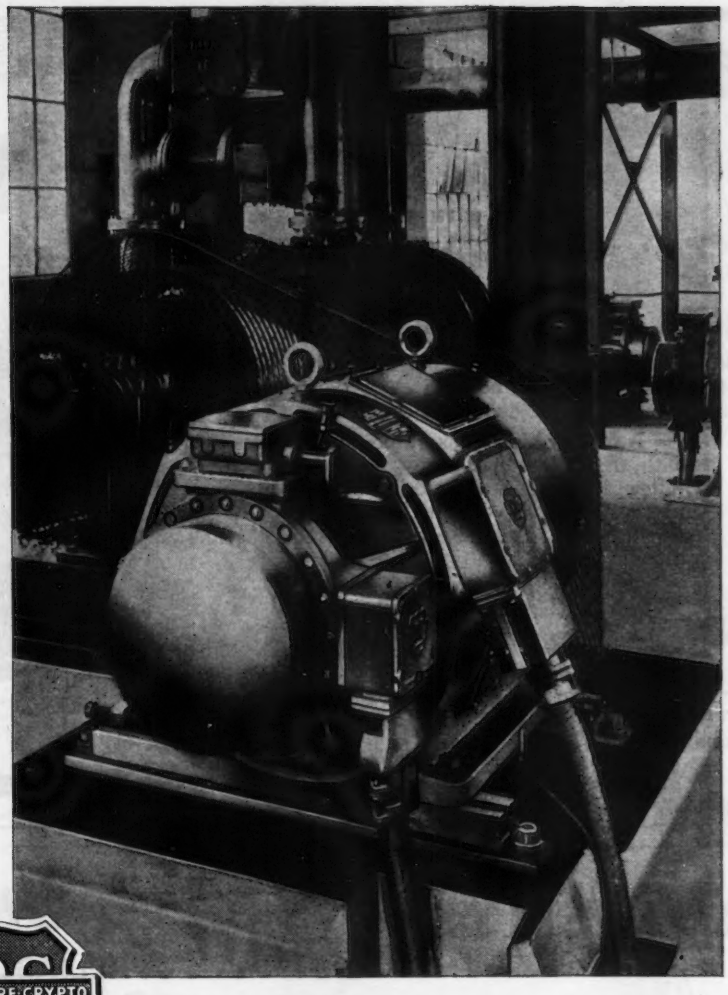

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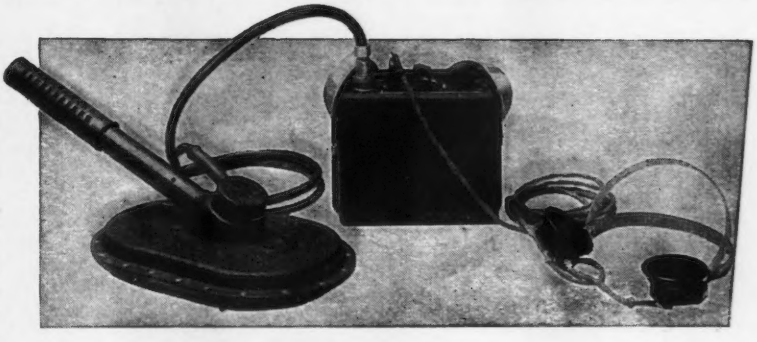

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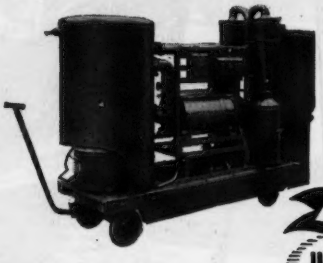

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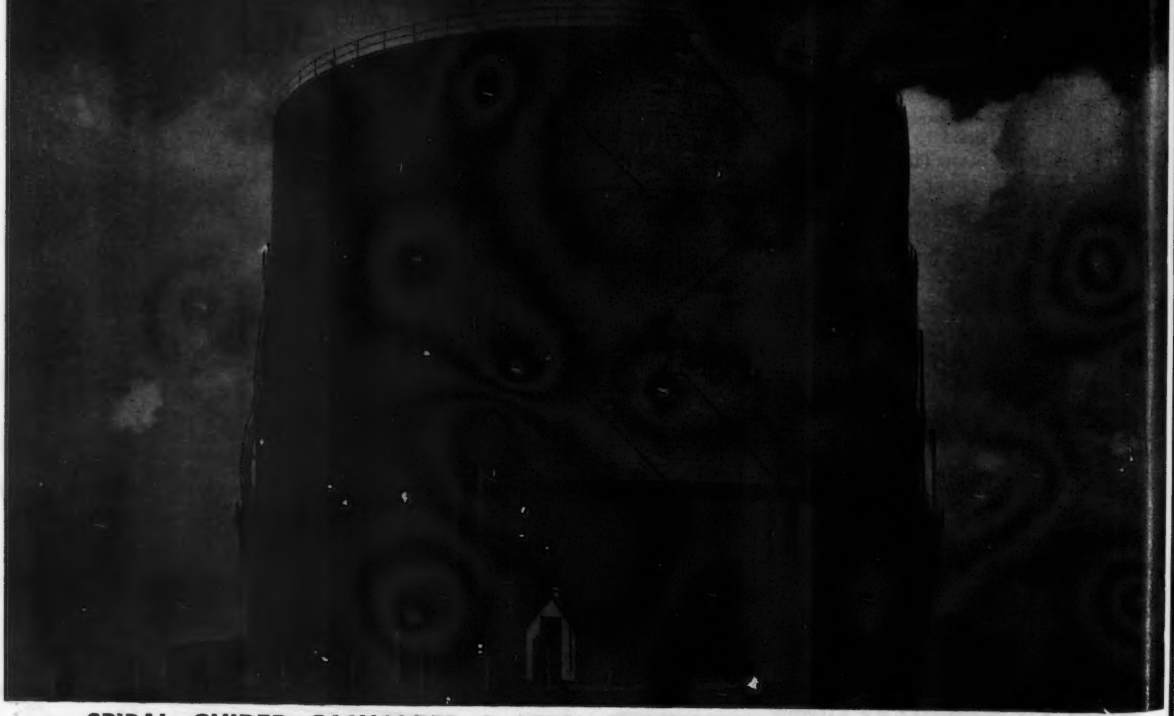

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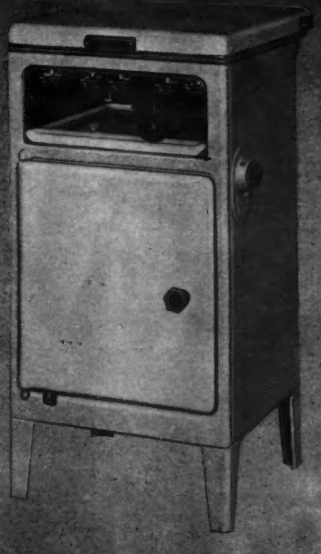

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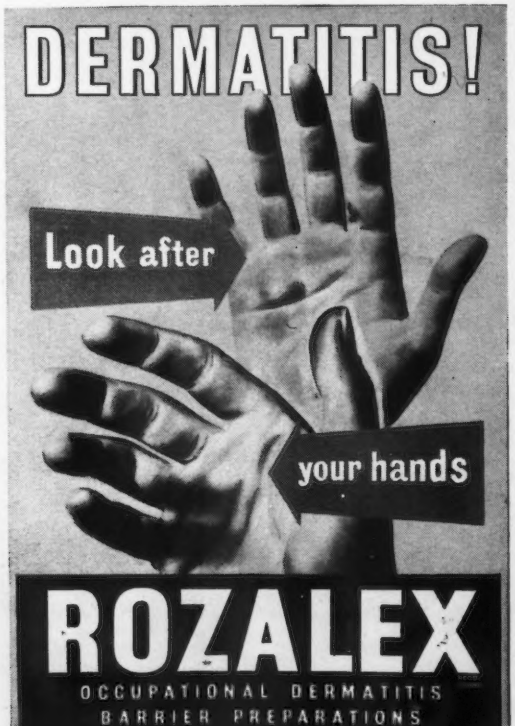

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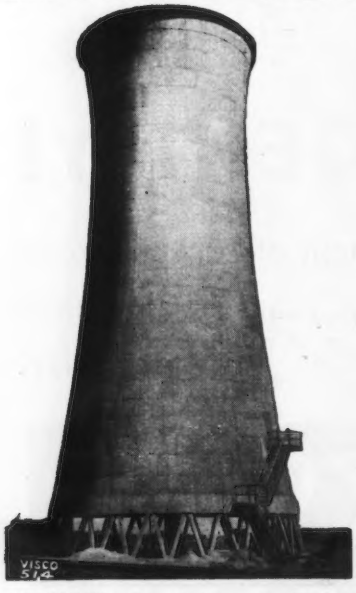

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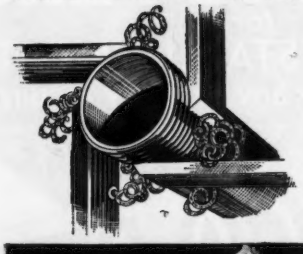

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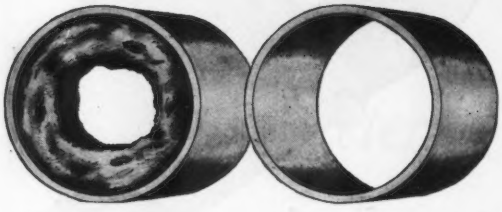

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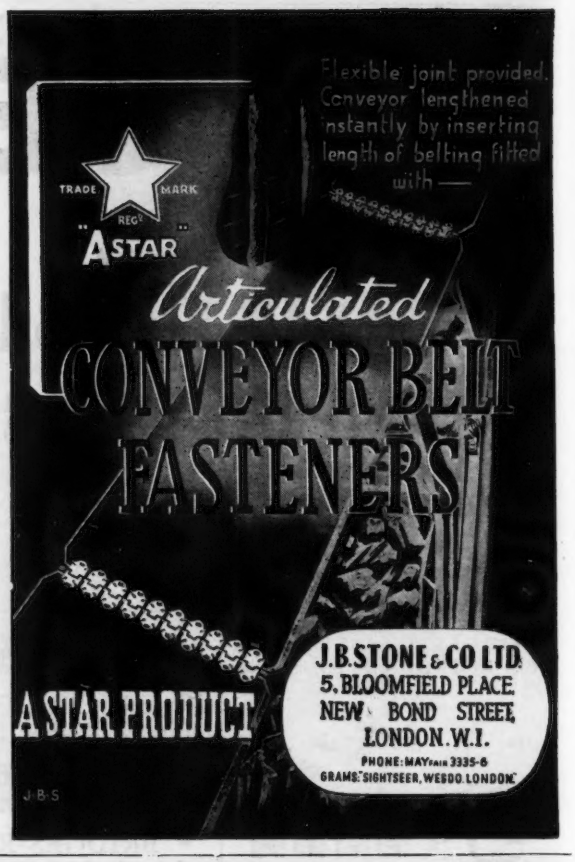

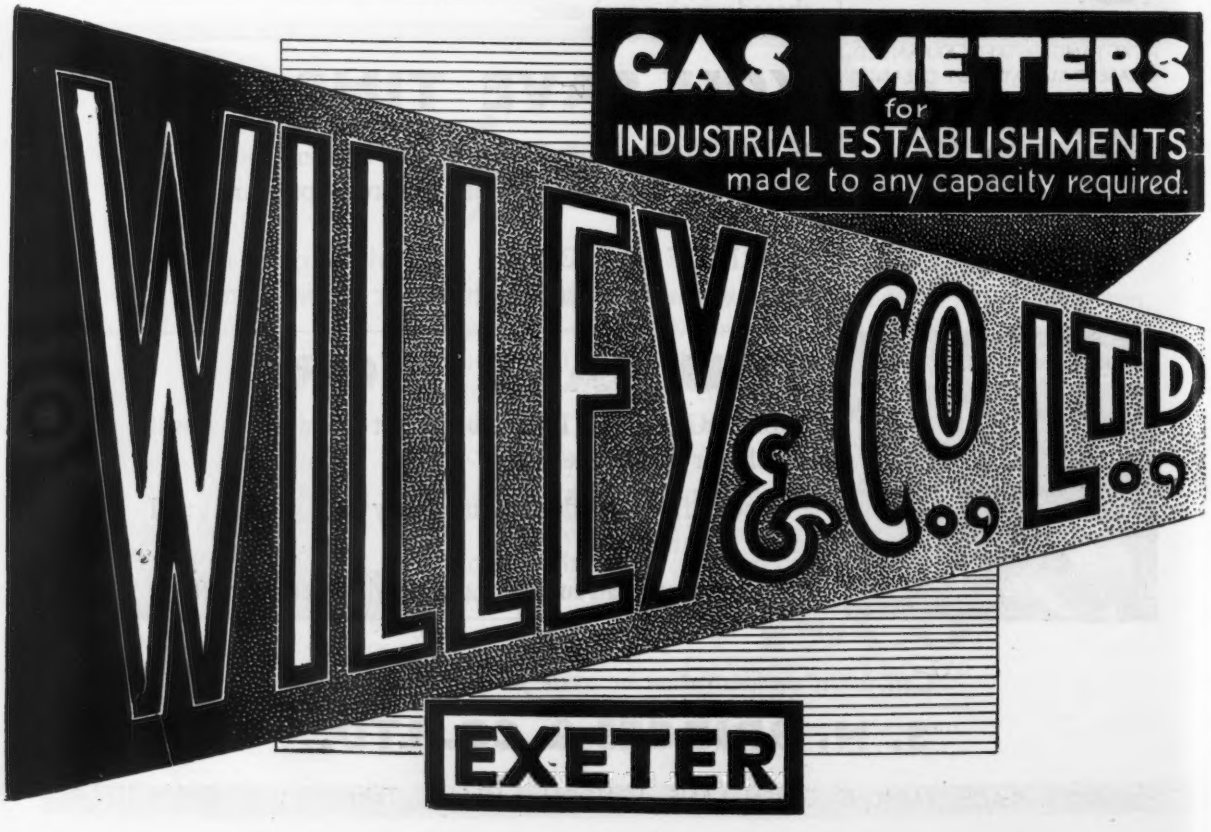

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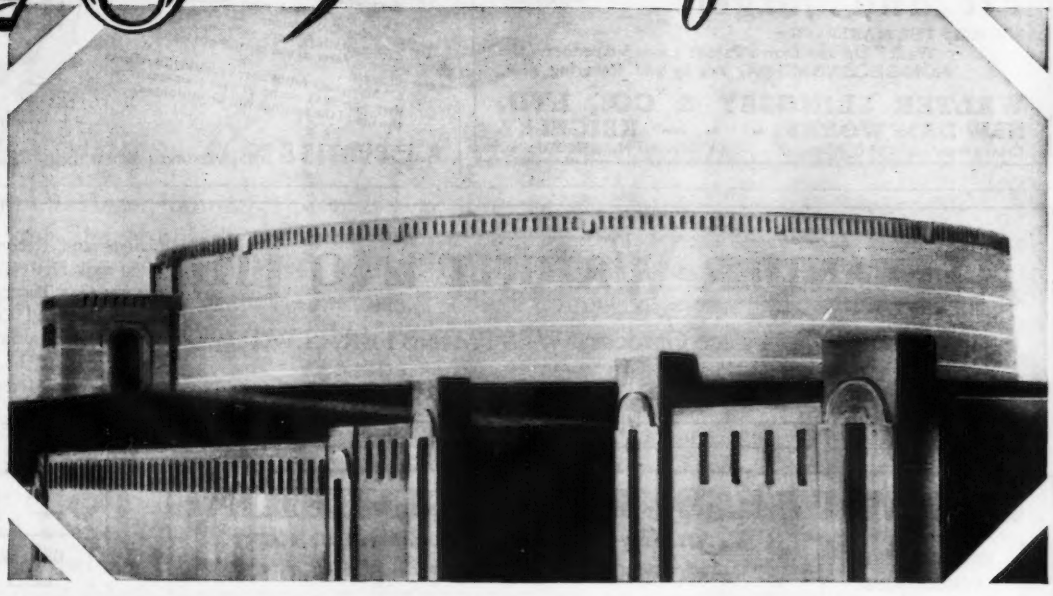

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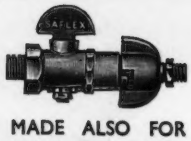

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Thomas Roe links Sindri with Slough

One at least among the many readers of the latest Annual Report to our Shareholders turned anew to chapter VII in H. Wood Jarvis's commemoratively exciting book, "Let The Great Story Be Told. The Truth About British Expansion." Sir Thomas Roe, "a gentleman of civill behaviour, of good breedinge, personage, and very good parts," chosen to be the King's Ambassador, "cast anchor off Swally" on September 18th, 1615, his task being to enhance the prestige of his country in the far places. Did he wear "scarlet cloak and hose with crimson satin doublet all trimmed with gold lace"? We cannot say for certain. But his "modestie, honestie, and integritye" won esteem and praise, his qualities of wisdom and understanding proving more precious than regalia. At Slough and Rotherham we of Bell's and Baines' salute the memory of Sir Thomas Roe, ambassador-pioneer. It is an honour to us to be participating in the industrial developments in the new India of whose good will we strive to be worthy. The Annual Report was enfolded in a reproduction of a marvellous photograph of insulation work by our Indian Company on Horten Spheres at the Government of India's Fertilizer Factory at Sindri, Bihar. Our Chairman devoted part of his speech to India at the Annual Meeting of Shareholders. He described the photograph as illustrating "one of the most spectacular achievements in insulation ever attempted anywhere in the world." From Swally in the year 1615 to Sindri and Slough in 1950 and from the "Lion" and the famous "Red Dragon" (the little ships carrying Sir Thomas and his suite to India) to the Salamander, which is our trade-token, is a large cycle of history. If we earn one tithe of the commendation bestowed on Sir Thomas, the pioneer who was *persona grata*, we shall rejoice.

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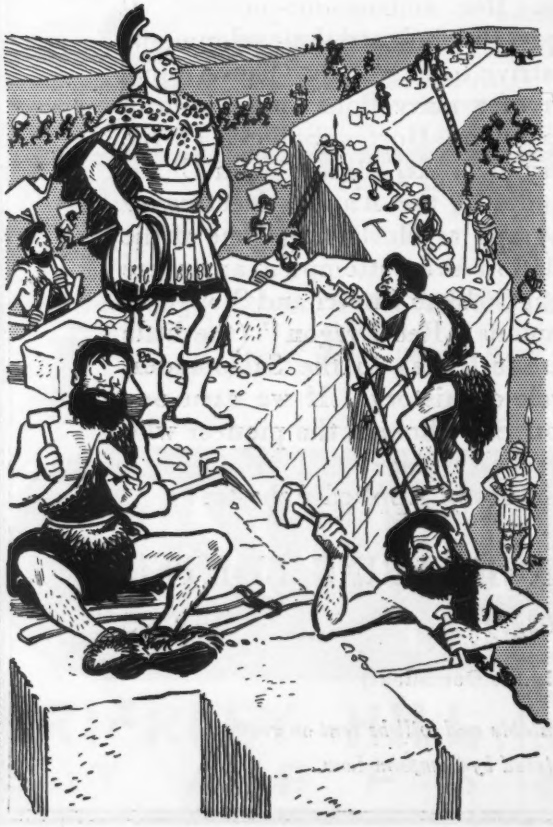
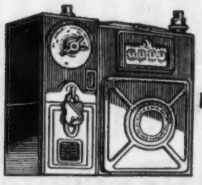


MOMENTOUS *Measures*

A DEFENSIVE MEASURE. No. 2

From River Tyne to Solway Firth,
(They show it to this day).
The Emperor Hadrian built a wall
to keep the Picts at bay.
But do you think he was wise
to hamper Scottish enterprise.

Scottish enterprise has since, however, had ample opportunity to justify itself, and the A & M Meter is a splendid example of a Scottish product that has made a reputation for itself far beyond the limits of Hadrian's wall.



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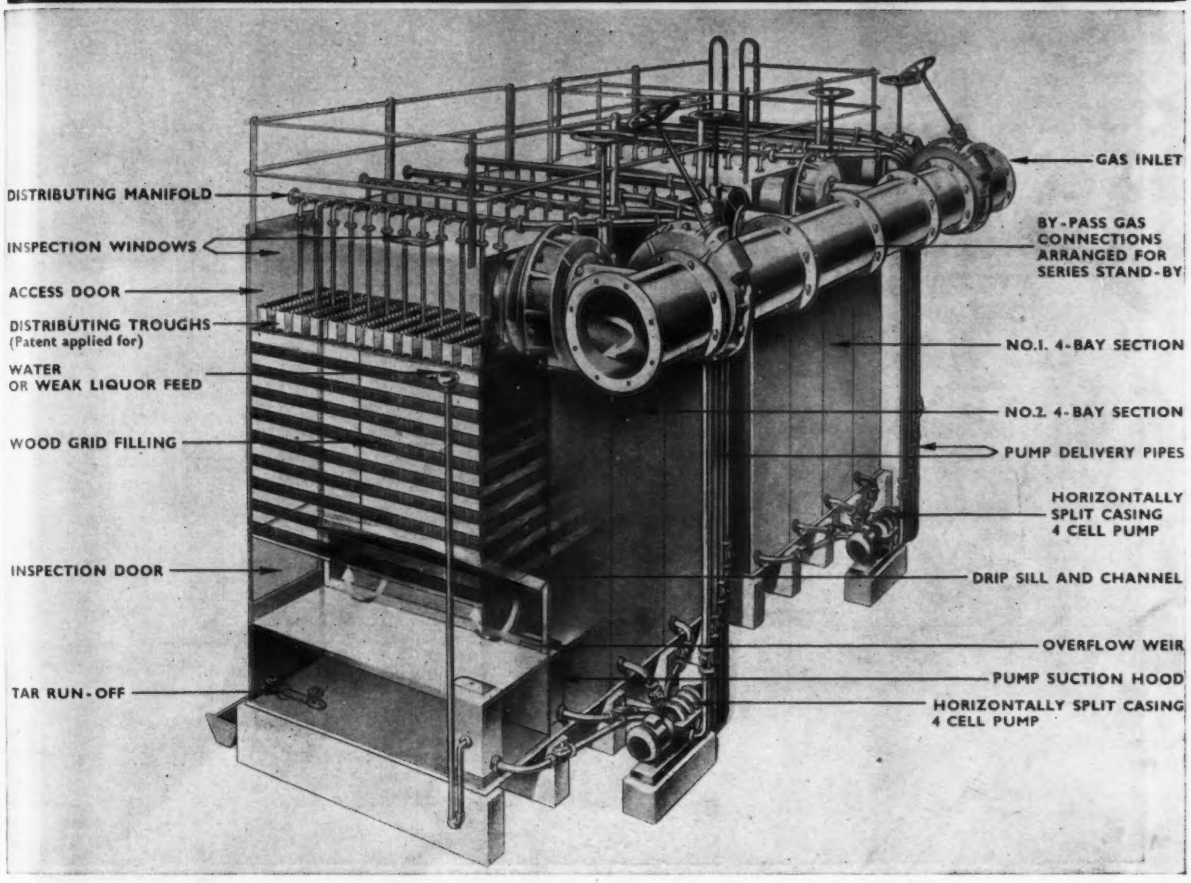

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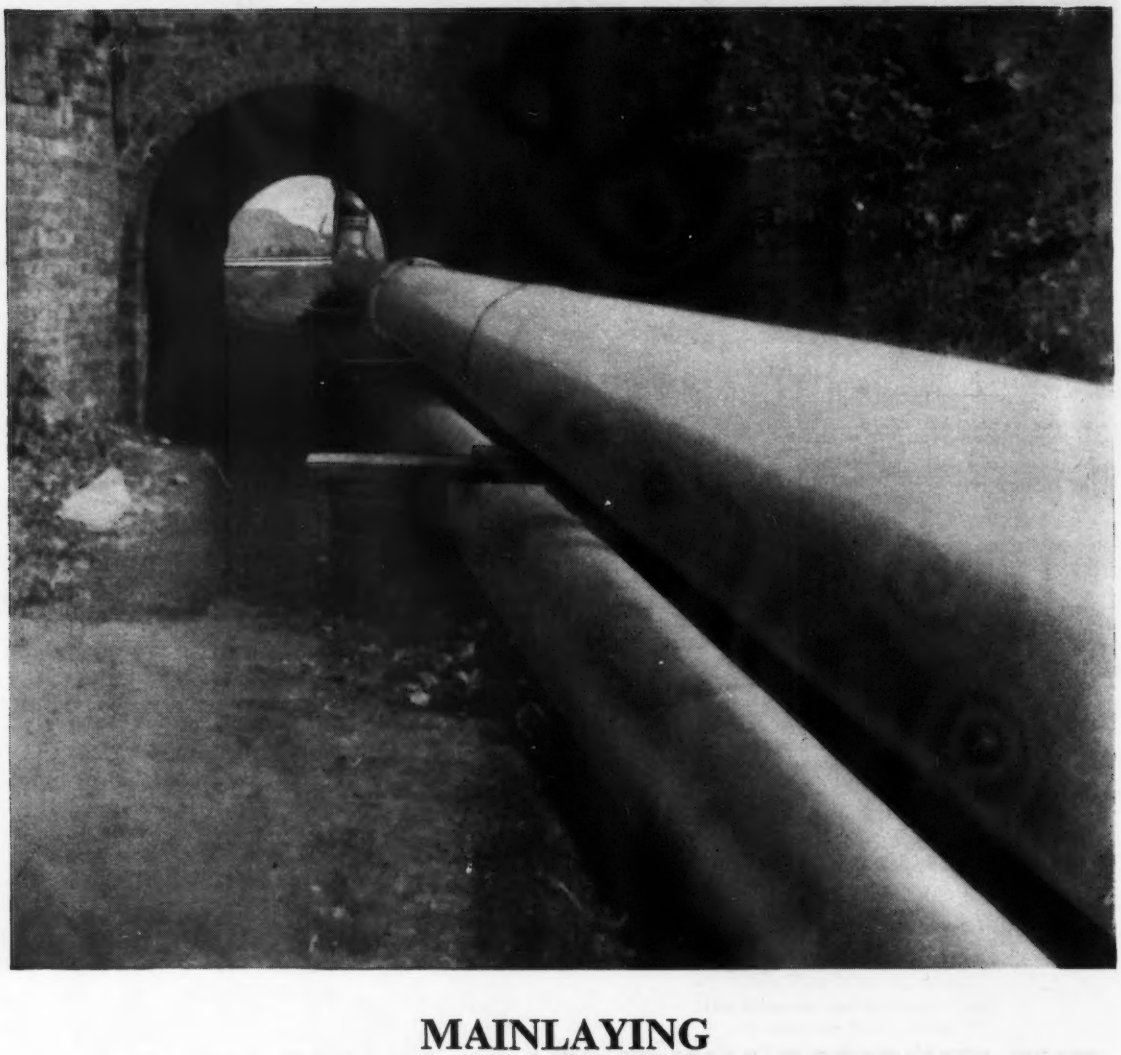

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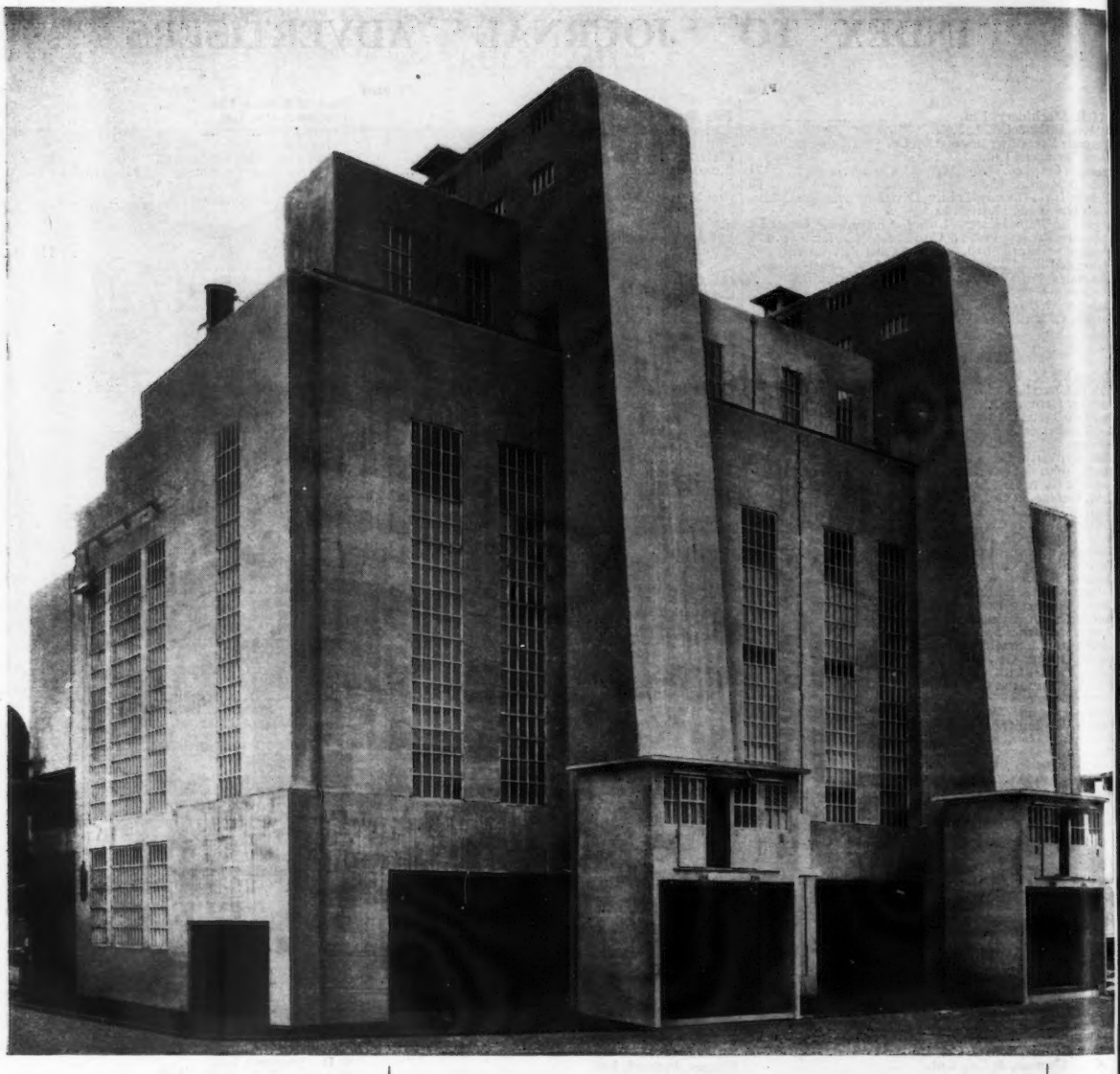

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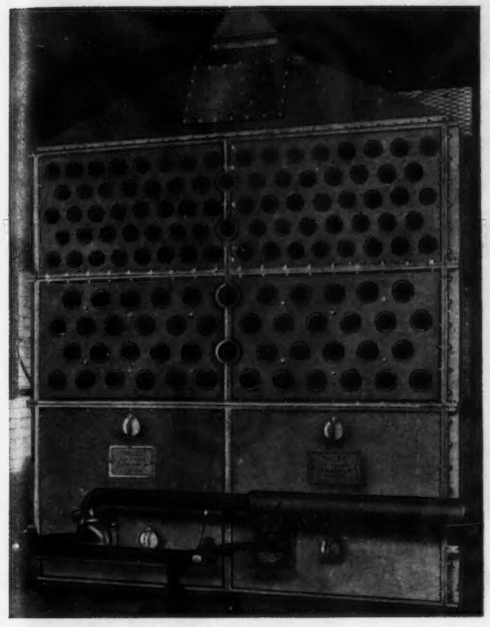

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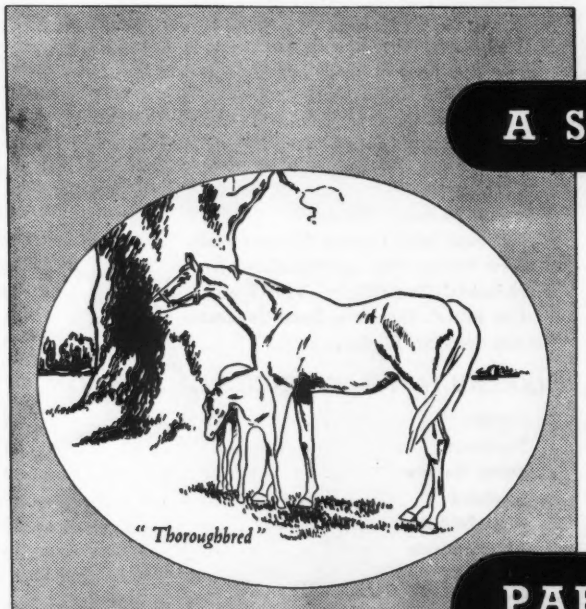

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GAS JOURNAL

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INDUSTRY AND POLITICS

LAST week's debate in the Lords on the position of Parliament with regard to the administration of nationalised industries and peers having duties connected with those industries provided some of their Lordships with an opportunity of criticising, rather vaguely, the conduct of the industries concerned but did nothing towards divorcing politics from industry, which is one of the chief desires of those who are doing their best to run their industries successfully in the national interest. Lord Strabolgi suggested that there should be a permanent standing joint committee of both Houses with power to examine Ministers and members of boards; a select committee of both Houses set up every three, four, or five years to examine each nationalised industry; and an investigation by the Monopolies Commission of prices and rates charged by the industries. Lord Alexander, for the Government, agreed that there should be periodic enquiry but suggested that they should be able to see more clearly in a year or two what was the best method to adopt.

There is probably less of politics in the gas industry than in any other, and the greater measure of decentralisation which it enjoys compared with industries nationalised at earlier dates removes it further from political pin-pricks than, say, transport or the coal industry. Nevertheless, the chairmen and members of the area boards, little less than the independent chairman and deputy chairman of the Gas Council, are open to political attack no matter how well they may run the industry. In pre-vesting days some of them, as chairmen of companies, met their shareholders once a year and at times had to answer embarrassing questions; today they do not meet the owners, at any rate collectively, but they are more exposed to public criticism, and the cry for 'more Parliamentary control' disturbs their concentration on the things that matter. Only last week we published an abstract of a paper by Sir Edgar Sylvester in which he said without hesitation that in the ordinary running of the gas industry there is already ample provision for public accountability, and he expressed his belief that the national interest would best be served by the Government taking every possible care in making appointments to public boards and by not hesitating to make replacements as soon as it becomes clear that satisfactory results are not being obtained.

Members of area boards are, by Act of Parliament, 'persons qualified in gas supply, local government, industrial, commercial or financial matters, applied science, administration, or the organisation of workers,' and either the chairman or deputy chairman of each board has 'had experience of, and shown capacity in, gas supply.' (At present one board is without a deputy chairman and another is short of a consultative council chairman who should sit as an *ex officio* board member.) One cannot reasonably discover political bias in the appointment of the present members of gas boards. Their contracts are on a five-year basis, and it may well be that some are baulked in their work by a feeling of insecurity. But directors of former gas companies had little more security, save the prospect of being re-elected by friendly proprietors as and when they were due to retire by rotation. Members of the Gas Council and area boards are now about half way through their initial period and they would welcome any indication that can be given by the Government or the Opposition as to the trend of events in the next few years. When in 1946 Mr. J. R. W. Alexander addressed all the districts of the former British Gas Council on nationalisation, he emphasised that state ownership had been advocated not only by the party then (and still) in power but by the leaders of the other parties. Last November, however, the Conservative Parliamentary Fuel and Power Committee appointed a sub-committee to consider partial or complete de-nationalisation of the gas industry. As we have already said, politics did not affect present appointments and we cannot foresee any changes in that respect

but possible variations in structure might mean changes in personnel. In this issue we record the re-appointment of all the members of the National Coal Board who were willing to accept office, but we cannot attach too much weight to that fact because the complexion of the Government has not changed since coal was nationalised. The sooner we know something of the shape of things to come, the better.

Meanwhile, could there not be a truce to political sniping? If the Government are pleased with the set-up and working of the gas industry or if they contemplate major changes in the event of their further return to power, let them say so; but let them openly decry the trade unionists who call parrot-like for control by the 'workers' and parliamentarians who make every occasion a suitable one for party propaganda and innuendo. If the Opposition, should they win the election, have other ideas for the industry—if they contemplate 'unscrambling' to greater or less extent—let them say so; and then they need not trouble to pop the political question, which probably embarrasses the men on the job more than it does the Hon. Members opposite.

We are convinced that all the present heads of the industry desire is reasonable freedom and a proper measure of security of tenure to enable them to get on with their job of 'developing and maintaining an efficient, co-ordinated, and economical system of gas supply . . . and satisfying all reasonable demands for gas.'

FUEL POLICY COMMITTEE

MR. P. J. NOEL-BAKER, Minister of Fuel and Power, told the annual conference of the National Union of Mineworkers at Blackpool last week that a special committee was to be set up at once to investigate the wider aspects of national fuel policy. Ever since the Ministry was set up, and more specially since the nationalisation of the fuel industries, the gas industry has taken its full share in calling for a national fuel policy, and the news that the new committee, which will be additional to the Fuel Economy Committee and will work for the co-ordination of the fuel services which the T.U.C. and other bodies have long recommended to the Government, is to get to work without delay will be welcomed. The committee will consider whether the various forms of fuel and power are being used to the best advantage; whether electricity should be used for domestic, office, and factory heating; whether gas should be used for public lighting; and what are the true costs, including capital costs, of the fuels in use for various purposes. The gas industry has much to gain, and little if anything to lose, as a result of co-ordination of fuel policy.

In announcing the appointment of the committee, Mr. Noel-Baker said that in 1950 we used 7 mill. tons more coal than in 1949 and at present the annual consumption was running at 8 mill. tons more than last year. If the increases of the past 18 months continued, consumption by 1953 would be nearly 30 mill. tons more than in 1949. It could be legitimately hoped that the staggering rate would not continue, but desperate efforts to eliminate waste were necessary. Something like 80 to 82% of all our fuel resources was wasted. If that could be cut to 72% some 60 mill. tons of coal could be saved annually. Much of the waste was preventable, and he had appointed a strong team of experts to see how industrial and domestic equipment could best be used.

Now was the time, said the Minister, to enquire whether winter fuel difficulties would be repeated. There would certainly be a greater coal consumption, and in addition to increased output heavier stocks would be necessary. Stocks were several hundred thousand tons below the target figure and since the beginning of May 200,000 tons had been lost through industrial disputes. He hoped for a big improvement in manpower and output per manshift.

COAL BOARD CHANGES

LORD HYNDLEY, who has served the coal industry with devotion during the first five years of its existence as a nationalised industry, will retire from the Chairmanship of the National Coal Board at the end of this month. If he had pleased himself he would have retired earlier but he acceded to the request of the Minister of Fuel and Power to remain in office for the full term for which he was originally appointed, and if the industry has not achieved all that he hoped for it has at any rate undergone far-reaching changes under his direction. He will be succeeded on August 1 by Sir Hubert Houldsworth, K.C., who has been Chairman of the East Midlands Division of the Board since 1946 and had formerly been Controller General of the Ministry of Fuel from 1944 to 1946, South and West Yorkshire Regional Controller from 1942 to 1944, and Fuel and Power Controller, North East Region, Board of Trade, from 1941 to 1942. From 1936 to 1942 he was independent chairman of the district co-ordinating committee of the Midland (Amalgamated) District (Coal Mines) Scheme, 1930.

Two Deputy Chairmen have been appointed—Mr. W. J. Drummond who, like the new Chairman, has served as a Divisional Chairman (North West Division, since 1949), and Sir Eric Coates, Finance Member of the Overseas Food Corporation, and chief of finance division in the British element of the Control Commission for Germany from 1947 to 1949. Another new appointment is that of Sir Andrew Bryan as a full-time member; he is Chief Inspector of Mines and is one of Britain's most distinguished mining scientists. All the other members, both full-time and part-time, have been re-appointed, including Sir Geoffrey Heyworth, Chairman of the Committee of Enquiry into the Gas Industry on whose report much of the nationalisation of the gas industry was based.

The four full-time members were described in the statement announcing their appointment as 'non-functional', which means that they will have no 'functional' or departmental responsibilities. The members will act as a board of directors, concerned with

policy-making for the coal industry as a whole, but they will not necessarily cease to give special attention to branches of the industry with which they are most fitted to deal. The opporunity presented by the expiry of the original contracts of Board members has been taken by the Government to do away with functional appointments altogether. News of the appointments reached the members of the National Union of Mineworkers at their annual conference at Blackpool. On the whole they were welcomed, particularly the choice of Sir Hubert Houldsworth as Chairman and the appointment of Sir Andrew Bryan, 'one of the best chief inspectors of mines,' as a full-time member. In a tribute to Lord Hyndley at the Blackpool meeting Mr. Noel-Baker said 'He brought to his immense task courage, candour, and common sense, and the last six months of his leadership has been a triumph. We wish him well in the new public work to which I am sure he will pass on'.

COAL AND COKE STORAGE

OPERATIONS on a very large scale often call for machinery and apparatus differing much in kind from those suitable to the smaller scale, but it will generally be found that the underlying principles are the same in both cases. While some of the considerations put forward by Mr. L. J. Clark and Mr. J. H. Walker in their paper to the Institution of Gas Engineers are correctly described as relating to the storage of coal and coke in the gas industry as a whole, superficially they relate primarily to only the very few, very large works. Their main concern, indeed, is with the problems of coal and coke storage in the biggest gasworks in the world. But solutions of these problems suitable to a works of 100 mill. cu.ft. daily capacity are not necessarily applicable in a works of one-tenth or less of that capacity. Furthermore, different treatments will be called for where the works is relatively isolated than where it is interconnected with a group of works among which coal stock and gas production can readily be shared and exchanged. The North Thames area is unique in the concentration and density of its population as well as by its unrivalled water-borne inter-communications. Engineers and designers of smaller works, less favourably situated, will need to bear these points in mind in their study of this excellent paper from which, in spite of that, much is to be learned.

At Beckton, three types of coal storage are maintained. The capacities of these are to be noted. Beckton carbonises about 50,000 tons of coal a week. The small, day-to-day, storage contains 6,000 tons, about one day's requirement at winter consumption rate. The intermediate storage ground is to accommodate 57,000 tons—say 12½ days. Main, long-term storage, is to be 250,000 tons, sufficient for six weeks. The aim is to stock 6½ weeks' requirement at the onset of winter to be worked down to 3½ weeks by the spring. Those figures set the scale.

Turning to principles, it is agreed that the two smaller storages should be situated near to the points of consumption and that movement of coal in and out of them should be fully mechanised. One thinks of the older designs in which these two types of storage are combined, of the coal store built in parallel or in series with the retort house and in which the same machinery fed coal either direct to the retort house or to stock. Surplus supplies on any one day were diverted to stock; deficiencies were made up by withdrawing from the store. In the 10 mill. works the coal store was designed for two or three weeks' supply, say 1,200 tons. The big, long-term, or dead storage would be stacked on ground perhaps some distance away and coal would be withdrawn from it only as required in the winter or in emergency, and no permanent machinery would be installed for this occasional handling.

On the very large scale it was necessary to differentiate between the day-to-day and the intermediate store. The character of the plant used in the latter at Beckton is very interesting; roughly, band conveyors above and below to fill and empty respectively and, surprisingly (that is to the 'small' and 'medium' engineer) the bulldozer to distribute over the pile. This bulldozer accomplishes another interesting purpose, related to the prevention of deterioration in stock. The enormous experience which these authors bring to this question makes their observations of great value. They leave no doubt that deterioration is mainly due to oxidation—'weathering.' It follows that prevention of air flow to and through the pile is more to be recommended than ventilation. To secure this, compacting by means of the bulldozer strikes one as something new, or at least these authors put it into a new perspective. The manner of its action is interesting too. The compacting action of the bulldozer with caterpillar tracks does not depend so much upon its weight as upon the scrubbing action of the tracks, which cause the fine coal to fill the voids between the larger pieces of coal. In this way bulk density is increased from the usual 50 to 62, to 67 lb. per cu.ft. This phenomenon, it should be noted, is observed with upgraded coal; it does not occur with graded coals from which the fines have been removed. These cannot be successfully compacted, but then they present less difficulty in the way of deterioration by heating—*i.e.*, by oxidation.

Other methods of dealing with this problem are described. Americans have sealed the pile with fine coal, tar, and so on. 'Fire-proofing' with bituminous emulsion is found to be considerably cheaper than the loss of calorific value without it. Air inlet at sides and bottom of the pile has been prevented by storing in basins, and more cheaply by walling round with segmental pre-cast concrete slabs. Losses at the bottom of the pile are avoided by providing a good flooring for which concreting is too expensive but a well consolidated hard core is effective and cheap enough.

It is clear that it pays to store coal properly, for the deterioration of coal in store may take the form of a reduction in thermal yield, loss of caking power, and degradation of particle size. In regard to the first, two observations at Fulham showed that a Durham Coal lost 3½ therms per ton in a year. This agrees well with experience. It used to be held that a coal in outside store would lose 5% of its thermal gas-making capacity

in the first 18 months, after which the deterioration slowed down, but not so much that it was not advisable to renew stocked coal every five years or so—this of course was in the halcyon days when coal was liable to lie about for many years. But these results indicate that most of the thermal loss occurs in the first four or five months of storing so that stocks without sealing or other protection, such as short-time storage, should be operated on the principle 'last in, first out,' to give the minimum overall loss. Mr. C. Johnson thought that thermal deterioration in stock was over-estimated and that no more than half a therm should be lost in stock in 12 months. Most of his hearers would think this unduly optimistic but one would like to hear more from him in detail in support of his view. Certainly the results of the Edinburgh trials by Jamieson and Skilling, with Scottish coals, were not conclusive. Degradation of particle size is not so carefully studied. Is this because in the horizontal retorts and coke ovens of Beckton it is not particularly important? Degradation of size in coal supplied to continuous verticals might result in a considerable reduction in throughput per retort.

Much is to be learned too from the clear exposition of the factors and principles which govern the policy of coke storage in the North Thames area, though it is possible that these may be different in some other areas and districts. Three types of storage are provided, the buffer or night storage hopper between the carbonising plant and the coke grading and storing plants, overhead bunkers for graded coke from which demands by road and rail are met, and the main seasonal storage. The night storage or buffer hopper capacity at Beckton is only of 12 to 18 hours production capacity. Many engineers would deem that too small an hourly capacity if it had to cover a possible breakdown of grading plant as well as its nightly stoppage. The bunker for graded coke at 48 hours production also strikes one as being small. It is of course recognised that 48 hours production at 100 mill. is a vastly different figure from that at 10 mill. At the same time one would think that good policy would dictate storing as much graded coke in bunkers as capital resources would allow. Every time coke is handled or re-handled there is some loss by degradation in size. In general 72 hours would seem to be desirable to cover long week-ends in which no coke may be taken away from the works. The figure, 20% of the annual make, for the main seasonal storage on the ground is an interesting and informative one.

The several methods of storing and reclaiming coke on and from the ground will be studied with care and profit. Deterioration of coke in store takes the form of breeze making, which may be found to be as much as 10%, a big figure. In the deep bunker, breakage has been reduced considerably by the use of the spiral chute, tests in the use of which at Lea Bridge are reported. Maintenance of these was found to amount to no more than 1d. per ton—to be matched against the estimate that 1% of breeze production may be equivalent to a loss greater than 4d. per ton of the coke made. It is good to hear that investigations are in hand with other forms of breakage prevention; perhaps there is something to be done in the shape and proportions of the bunkers themselves.

The perennial question, whether coke should be stored on the ground, graded or ungraded, is discussed. Degradation of graded coke stored in bulk was found to be surprisingly small, even with continuous vertical retort coke. One wonders whether this is due to the relatively great strength of the pieces left after handling and grading, after, that is, the knocking off of the fragile corners and the breaking down of the weaker pieces. In any case it is to be noted that all the coke sold is debreezed at the point of final delivery to the consumers' bags or vehicles.

The discussion of this 'useful compendium,' as Dr. Burns aptly described it, was keen and informative. There was no serious disagreement with its main conclusions. In everyone's mind was the changing situation in regard to coal stocks which is to be faced by the industry. Mr. George Currier put it neatly into figures. On the north-east coast—*i.e.*, actually on the coalfields—the gasworks used to get 40% of their annual requirement delivered in the summer and 60% in the winter, coinciding, that is, practically with the season's requirement. Now coal must be stocked in the summer to cover the winter's requirement. And that must be the picture throughout the country.

TIME, GENTLEMEN!

PUBLISHING costs soar. With 'independent' periodical publications these rises do in fact impose an economic censorship, though this, of course, does not prevent authors of papers presented to the gas industry from going Roneo-haywire. But this aspect is not the purport of our note. We have received the third issue of the *Ipswich Division Magazine* (55 pages plus blanks). The editors of house organs within the gas industry are certainly not cramped. In spite of their forewords they are carefree, and in some cases 'clocking-in' is anathema to them. Sour grapes? We do not know. Running through the *Ipswich Division Magazine* we find an apology from the editor that he is a few weeks late, but, as he explains, 'it was intentional in order to bring it into circulation during the usual quarter months.' Oddly enough, it would appear to be the wrong quarter, for we learn that the summer number will, with luck, be published in autumn. We have mentioned, with a tinge of envy, that the current issue of the *Ipswich Division Magazine* has blank pages, presumably for notes and possible criticisms. And yet, 'several articles have been held over as space cannot be allotted to them.' The wheels of nationalised journalism grind extremely strangely.

CHEMICAL INDUSTRY

ON Monday of this week there opened the 70th annual meeting of the Society of Chemical Industry. Fittingly the venue is London in this Festival Year. The meeting, with, as ever, an international flavour ends next Friday after auspicious technical sessions and visits covering a wide field. The social events are distinguished. The Society's President-elect is Mr. John Rogers, O.B.E., Chairman of I.C.I., a member of the Society since 1899. The retiring President, Mr. Stanley Robson, is one of the leading British

experts on the manufacture of sulphuric acid and has been responsible for many developments in metallurgical processes for the extraction of zinc. The Medallist is Professor E. C. Dodds, M.V.O., F.R.S., internationally famous for his synthesis with Sir Robert Robinson and others of stilboestral and for his work on the preparation of insulin. The theme of the lectures at this year's meeting is 'Water in Industry,' and the general introduction is to be given today by Mr. H. W. Cremer, C.B.E., President of the Royal Institute of Chemistry. Disposal of industrial waste waters naturally figures for discussion, and as far as Great Britain is concerned the subject is in the hands of Dr. B. A. Southgate. Chairman of the London Section of the Society is Dr. Allan C. Monkhouse, well known and well liked in the gas industry, Deputy Director of Fuel Research.

VACUUM CLEANER JUBILEE

A RECEPTION was held in London last week to celebrate the 50th anniversary of the invention of the vacuum cleaner by Mr. H. Cecil Booth, who is still Chairman of the company he formed—the British Vacuum Cleaner and Engineering Co., Ltd. His first cleaners, produced when he was a young civil engineer employed on the erection of the great wheels at Blackpool, Earls Court, and on the Continent, bore little resemblance to present-day machines. They were made with a powerful vacuum pump, driven by petrol or electric motor mounted on a van which was drawn up at the kerbside, and dust was sucked from carpets and furniture through long hoses. Preparations for the coronation of King Edward VII in 1902 included the vacuum cleaning of the blue carpets under the two large thrones, and this resulted in a demonstration at Buckingham Palace in the presence of the King and Queen Alexandra. The Czar, Emperor Wilhelm II, President Fallieres of France, and the Sultan of Turkey became interested, and soon the Houses of Parliament, theatres, and large hotels installed their own vacuum cleaners. During the first world war the company removed 23 tons of dust from the Crystal Palace and thus helped to abate an epidemic among the Naval Division then stationed there. The vacuum cleaner has made an increasing contribution to labour-saving, health, and comfort not only in the home but in industry, and many B.V.C. plants are employed on gasworks, where there is a continuous accumulation of hot soot on the top of retorts. By the suction process this can be removed without the necessity for shutting down. As the soot is hot the company has designed special equipment whereby the soot is water-cooled in the machine.

GAS COUNCIL GAS ISSUE

The Gas Council is to make a public issue for cash. Applications will be opened and closed tomorrow (July 12) for an issue of £75 mill. British Gas 3½% Guaranteed Stock, 1969-71. The price of issue will be 98%.

This is the first approach by the Gas Council for new money to private investors. A cash issue of £40 mill. was made in May, 1949, but this was issued to the National Debt Commissioners. It was already apparent, however, from the recent report of the Council on its first year's operations that the organisation was nearing the stage when it would need to replenish its capital resources. The proceeds of the present issue are required, in fact, to repay temporary borrowings, which amounted at July 2 to £48,600,000; to meet fresh capital expenditure (though this is still limited by the general Government restraints on investment); and to provide working capital for the Gas Council and the 12 area boards.

Personal

Mr. Robin Wilson, Parkinson Stove Co., Ltd., has returned home after a further spell in the Leeds Infirmary, and is making good progress.

◇ ◇ ◇

Mr. J. D. Rees, Manager of Llanwrst (North Wales) gas undertaking for the past three years, has been appointed Distribution Engineer to the Carmarthen group of gas undertakings. He was previously at Llandovery.

Obituary

The death occurred suddenly on June 27 of **Mr. H. C. Mills,** Managing Director of the Morgan Crucible Co., Ltd. In him the company had a senior executive of great ability and unbounded energy.

◇ ◇ ◇

Mr. William McKinlay, well-known in Scottish gas circles, died at Carluke last week aged 55. He became Secretary of Armadale Gas Company over 20 years ago and ultimately was Secretary and Manager. When Armadale, Broxburn, Shotts, Fauldhouse, and West Calder came within the scope of the Caledonian Gas Corporation, he became Secretary of the group of five companies, relinquished the job of Manager at Armadale, but took over the Managership at Broxburn. He retained these posts until nationalisation and from then until his death was Manager at Broxburn and Secretary to Armadale, Fauldhouse, West Calder, Shotts, and Broxburn group.

Diary

July 14.—Manchester District Junior Association of Gas Engineers: Ladies' Day, Chester; visit to Chester works.

July 18.—Scottish Gas Consultative Council: Caledonian Hotel, Edinburgh, 11.15 a.m.

July 20.—Wales Gas Consultative Council: Meeting, Colwyn Bay.

July 20.—Manchester and District Section, I.G.E.: Chairman's Day. Luncheon, Bolton Town Hall. Visit to Wigan gasworks.

July 21.—Gas Council Industrial Gas Development Committee, Gas Industry House, 9.30 a.m.

July 26.—North Thames Gas Consultative Council: Caxton Hall, Westminster, 2.30 p.m. (Note.—Not Westminster City Hall on this occasion.)

July 27.—Northern Junior Gas Association: Address by A. Pillans, Works Manager, By-Product Works, Northern Gas Board, followed by a visit to St. Anthony's By-Product Works, Northern Gas Board, Newcastle.

Aug. 30-Sept. 13.—Engineering, Marine, and Welding Exhibition, Olympia. (Gas Council exhibit).

Sept. 4.—East Midlands Gas Consultative Council: Victoria Station Hotel, Nottingham, 11.30 a.m.

Sept. 6.—North British Association of Gas Managers: Annual General Meeting, Ayr. (Golf and bowling functions, Sept. 5; Excursion, Sept. 7).

Sept. 10.—West Midlands Gas Consultative Council: Dudley Room, Queen's Hotel, Birmingham, 2.30 p.m.

Sept. 17.—Eastern Gas Consultative Council: Connaught Rooms, Great Queen Street, 2 p.m.

Sept. 18-21.—Association of Public Lighting Engineers: Annual General Meeting and Conference, Brighton.

Sept. 19.—South Western Gas Consultative Council: 34, Bridge Street, Taunton, 11 a.m.

Progressive Development at Rotherham

Former Owners Inspect Gas Board's Extensions

ROTHERHAM Borough Council were the guests of the Sheffield and Rotherham Division of the East Midlands Gas Board on June 25, for a tour of inspection of the Car House gasworks, Rotherham. The civic party included the Mayor of Rotherham, Councillor A. R. Shayler, the Deputy Mayor, Alderman C. E. Geary, J.P., and the Mayor of Doncaster, Alderman Mrs. Rose Hodson, who is also Chairman of the Sheffield and Rotherham Division Committee of the Gas Consultative Council, and a number of officials and Councillors of the Rotherham Borough Council. The party also included Mr. Jack Jones, M.P. for Rotherham.

On arrival the visitors were welcomed by the Chairman of the East Midlands Gas Board, Mr. H. F. H. Jones, J.P., Mr. Sydney Smith, Deputy Chairman, Alderman C. R. Bates, J.P., Chairman of the Consultative Council, Mr. E. H. Harman, B.SC., Divisional General Manager of the Sheffield and Rotherham Division, and Mr. E. B. Field, Assistant General Manager.

The party saw much to interest them during their visit to the works, the development of which was begun by the Gas Department of the Rotherham Corporation prior to nationalisation. The Corporation planned to centralise at this works the manufacture, purification, and storage of gas for its area of supply. The aim of the East Midlands Gas Board is that the works will have an ultimate output of 24 mill. cu.ft. of gas per day, which will comprise 15 mill. cu.ft. of manufactured coal gas, 5 mill. cu.ft. of coke oven gas and 4 mill. cu.ft. of carburetted water gas. Two carburetted water gas plants constructed by the Power-Gas Corporation, Ltd., attracted much attention. Each plant has a capacity of 2 mill. cu.ft. per day. Between them the plants were of material assistance in relieving to a large extent the difficult gas supply position in Sheffield over the past few years.

Site preparations have commenced for a complete carbonising unit of 10 mill. cu.ft. of gas per day. The complete installation, which will cost in the region of £2,500,000, will include plant for coke screening and grading, benzole recovery, and wet and dry purification. The carbonising plant will be of the intermittent vertical chamber oven type, arranged for firing either by producer gas or coal gas. It will be erected in four units with provision for an extension to increase the capacity by one-half.

The visitors saw the foundations and structural steelwork for the tower purifiers which are being erected by Henry Balfour and Co., Ltd. This installation when completed will be the first of its kind in this country. The foundation for the new 6 mill. cu.ft. capacity gasholder also was of special interest, because this was originally planned as a scheme of the Rotherham Corporation for a gasholder of 3 mill. cu.ft. capacity. The holder was doubled in planned size by the East Midlands Gas Board to be more in accord with the requirements of the Sheffield and Rotherham Division viewed as a whole. The holder is being erected by R. and J. Dempster, Ltd. Other gasholders at the Car House works include a 2 mill. cu.ft. waterless holder, the only one of its type in the Sheffield and Rotherham Division, and a 3 mill. cu.ft. spirally-guided welded holder erected by the Oxley Engineering Co., Ltd. This firm also erected the small holder which operates as a carburetted water gas relief holder.

Mr. H. F. H. Jones, Chairman of the East Midlands Gas Board (carrying raincoat), accompanies the visitors on their tour of inspection.

After completing the tour of inspection the company were the guests of the East Midlands Gas Board at a luncheon in the Royal Victoria Station Hotel, Sheffield.

Proposing the toast of the County Borough of Rotherham, Mr. E. H. Harman, B.SC. (General Manager, Sheffield and Rotherham Division), said that when the Board took over, rather more than two years ago, there was in Sheffield a serious shortage of gas, and for a period the Sheffield industrialists had been putting up with gas cuts. There was, however, in Rotherham, a different story. The Rotherham undertaking had a progressive management and a forward-thinking Gas Committee and Corporation. They had been taking a very long view, and it was the Board's good fortune to find in Rotherham, plant capable of turning out 4 mill. cu.ft. of gas per day. It did not take a great deal of work on the Board's part in connecting mains, etc., and the gas was able to flow to Sheffield in the winter of 1949-50. There was only one gas cut during that winter, and Sheffield industrialists were not slow to express their appreciation. Without the progressive and forward thinking of the Rotherham Corporation Gas Department, the story could only have been half told, said Mr. Harman. 'It was the Rotherham gas undertaking that tipped the scales.'

A number of chief officers of the Rotherham undertaking had been given duties in a larger sphere, including Mr. E. B. Field, who was formerly General Manager and Engineer of the Rotherham undertaking. So far as the Board was concerned, the Rotherham undertaking was still a happy hunting ground for promotion. Mr. Harman also paid tribute to the many well known men whose names had been prominently linked with the gas undertaking in the past.

The Mayor of Rotherham (Councillor A. R. Shayler), responding, said the Rotherham Borough Council was very interested in what had been said by Mr. Harman about the gas undertaking, of which it was very proud. 'We realise the overall need for nationalisation, and we believe you will give the people of Rotherham as good a service as we did, and in due course, a better one. We were not entirely happy at the news of nationalisation and we were not very pleased to hand over to you, but we realise the good concerns had to suffer for the bad. Rotherham was a progressive Borough, and, despite its losses, will continue to be progressive.'

Mr. Jack Jones, M.P., proposing the toast of the East Midlands Gas Board, said the Board was a worthy institution. Anyone wanting answers to any ques-

(*Continued on p. 107*)

Gas in Smallest Welsh City

PREPARATIONS FOR ST. DAVID'S MUSIC AND DRAMA FESTIVAL

OF the three official Festival of Britain activities to be held in Wales, one, the Festival of Church Music and Drama, is being held in the Cathedral Church of St. David's, the smallest Welsh city, situated in the extreme western corner of Wales. A more fitting venue for such an occasion is hard to visualise—the organisers surely being prompted with the same thoughts as their forefathers who erected their cathedral amid scenery of such beauty as only Pembrokeshire can boast.

The significance of the occasion will be further marked by the presence of the Duchess of Kent, who will attend the performances tomorrow evening (July 12).

The Wales Gas Board is co-operating in ensuring that not only are the local residents ensured of an adequate and efficient gas supply to meet all needs during the period, but that the official catering at the Festival shall be of a standard equal in service and efficiency to that of the greater cities and towns throughout England and Wales.

The Board's contribution through its undertaking at St. Davids is a tangible one inasmuch as it is providing all the catering equipment and gas supplies for the feeding of anything up to 1,000 people per day. The official caterers are providing a marquee in which the following gas equipment will be installed: Two double oven cookers, six 25 gal. gas boilers, two gas drying cupboards, two large size hot water storage sets, 25 gal. per hour each, and one large refrigerator.

The maximum consumption of these appliances is 2,500 cu.ft. per hour. This consumption would generally be thought to be very small, but relative to the maximum output of the undertaking, namely, 20,000 cu.ft. per day at peak load summer period, it will be seen that if the kitchen is in operation for four hours a day only, it will mean an increase in gas output per day of anything up to 50%.

The gasworks at St. Davids is situated about 1¼ miles from the city itself, nestling in the valley of the Alan River. The early planners of the gas undertaking at St. Davids had a reason for building it where it is, only a stone's throw from the beautiful little harbour of Porthclais. Here not so many years ago small coastal vessels brought the coal to the undertaking whose maximum requirements at that time were about 250 tons per annum.

This was very necessary as St. Davids itself is 16 miles from the nearest railway station. In recent years seaborne coal supplies have ceased, the coal now being brought by road transport from the nearest town of any importance, namely, Haverfordwest.

In order that adequate gas supplies will be available for the Festival every precaution has been taken to ensure that the existing gas making plant is in first class order.

To supplement the existing gas making plant which comprises two small beds of horizontal stop-end retorts, one bed of four and one bed of five, a small producer has been built. With the addition of producer gas there may be difficulty in maintaining the correct calorific value. In order that there will be no reduction of C.V. butane gas in cylinders is to be provided to control accurately the calorific value of the gas supplied.

By these additions it is anticipated that the hourly make will be increased from 1,500 cu.ft. to 2,500 cu.ft., which it is anticipated will be adequate to meet the demand always allowing for a full gasholder to start the day. These measures are necessary because of the inadequacy of the holder which is only 10,000 cu.ft. capacity.

Gas Board Fined for Selling Short Weight Coke

GUILDFORD magistrates commented on a lack of supervision after hearing a case on June 29 concerning the supplying of short weight coke by the South Eastern Gas Board. The Board was fined £5 for selling coke of less quantity than the stated amount and £5 for failing to ensure that the vehicle used for delivery was equipped with a proper weighing machine.

It was stated by Mr. G. L. May, solicitor for the Gas Board, that until recently the weighbridge clerk at Guildford gasworks, while employed in that position, was also a delivery contractor whose lorries were used by the Board for coke deliveries.

Mr. James A. Ross, an inspector of weights and measures, said the contents of sacks of coke being delivered from a lorry were weighed. They were found to be 334½ lb. short on the whole 40 cwt. involved. The driver of the lorry said he had weighed the coke out on some scales which he said were faulty. The lorry was owned by the firm of Drew and Ellis and was under contract to the Gas Board.

When the inspector called at Guildford gasworks the weighbridge clerk said his name was Drew and that he was one of the owners of the lorries as well as being weighclerk. When the lorry left the works on that particular day he had not weighed it owing to congestion, but had later made out a weigh ticket for the records. On the following day he telephoned and said he made a mistake and no ticket had been made out. The scales were not on the lorry because they were not accurate.

Mr. May said the set of scales usually carried on the lorry had been sent back to the makers and some spare scales were run over. Some scales were borrowed from a local firm, but were found to be faulty.

Commenting on the case, the Chairman of the Bench said 'The facts which have been disclosed regarding the relation of the contractor and the clerk of the weighbridge certainly give rise to the conclusion that there was something lacking in supervision.'

Mr. May said the matter would never have arisen if the clerk had carried out his instructions. The Board had no excuse, but a police order prevented lorries waiting outside the gas works as it caused congestion.

'The Board take a serious view of the matter and of the arrangements at Guildford where a clerk is also a contractor,' said Mr. May. He stated that the firm had lost its contract and another was now employed.

FESTIVAL FARE

Mr. W. K. Hutchison (Chairman of the Board) speaking at the South Eastern area final. On his right is the Marchioness of Cholmondeley, who presented the prizes.

The pages of the 'Journal' have told by word and picture the story of the Festival Fare National Cookery Competition—probably the biggest co-ordinated publicity effort ever staged by a single industry. We report here the last batch of area finals.

SOUTH EASTERN

ON Friday, June 29, Mrs. B. G. Revell, of Ramsgate, won the South Eastern Gas Board area final. Her prize was a gas refrigerator. She was one of over 6,000 entrants in the South Eastern Area.

At the judging and presentation of prizes, Mr. W. K. Hutchison (Chairman of the South Eastern Gas Board), who presided, said this was a practical contribution by the Women's Gas Federation to the Festival of Britain and there could not be a better way of bringing the Festival into the limelight. Dame Vera Laughton Mathews, D.B.E., Chairman of the Festival Fare Competition Committee, also spoke.

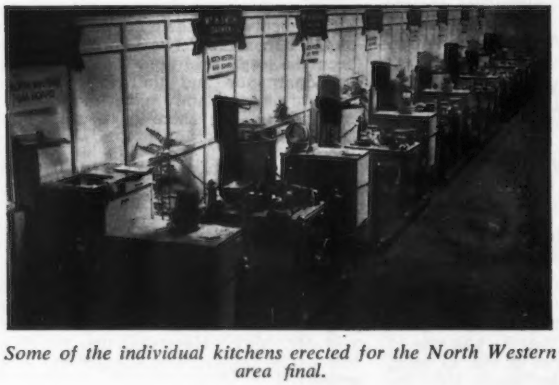
The judges were Mrs. Marguerite Patten, Television Cookery Expert, Miss Jane Beaton, Cookery Adviser to *Woman's Own* magazine and Miss Gertrude Tullis, Cookery Expert to the Good Housekeeping Institute. The Marchioness of Cholmondeley, C.B.E., presented the prizes.

Mr. R. S. Johnson (Deputy Chairman of the Board) thanked the guests for coming and the Marchioness for presenting the prizes. The Mayoress of Croydon in response thanked the Women's Gas Federation for running the competition and also the competitors and the judges and went on to say that while many viewed the passing of the old gas company and management with regret, she felt that their successors did not intend to lose the relationship built up over the years.

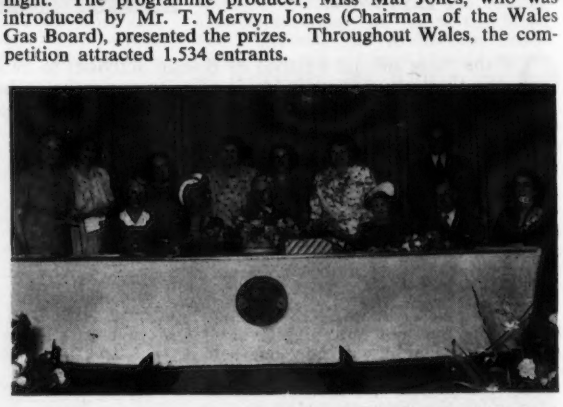
WALES

ONE of the twelve competitors qualifying for the final at the Park Lane Hotel on July 10 will be a 15-year-old schoolgirl. Winning her way through the Pembroke Group competition, Thelma Phillips competed with 16 experienced housewives and won first prize in the Wales Gas Board's area finals held in Cardiff on June 28. She came straight to the competition after sitting a three-hour examination paper.

The finals were tied up with the radio show, 'Welsh Rarebit,' and while the dishes were being judged the 500 in the audience heard members of the cast who were broadcasting the same night. The programme producer, Miss Mai Jones, who was introduced by Mr. T. Mervyn Jones (Chairman of the Wales Gas Board), presented the prizes. Throughout Wales, the competition attracted 1,534 entrants.



Some of the individual kitchens erected for the North Western area final.



Mr. H. F. H. Jones (centre), Chairman of the East Midlands Board, with the County finalists, and, seated on his right, Mrs. Jones. The judge, Miss Helen Burke, is on the extreme right.

NORTH WESTERN

NEARLY 1,400 people, including 18 mayors, were present at the North Western area finals in the Manchester City Hall on June 28. The contest attracted 3,500 entries from the Board's area.

Part of the proceedings, which were opened by the Lord Mayor of Manchester (Councillor W. Collingson, J.P), were nationally broadcast in the B.B.C.'s 'Woman's Hour' programme, when six million listeners heard 'Mrs. Dale' (Miss Ellis Powell) announce that the first prize had been won by Mrs. Charlotte Cunliffe, a 65-year-old Rawtenstall housewife. The broadcast also featured recordings made during the day by the well-known B.B.C. commentator and cookery expert, Bruce Blunt, interviewing the contestants as they cooked the test menu.

Following the prize-giving, the audience watched a 45-minute fashion show. Miss Thelma Hughes ('Sally Lane' of 'Mrs. Dale's Diary') acted as commentator.

After the Chairman of the North Western Gas Board (Mr. D. P. Welman) had brought the formal proceedings to a close, the 17 cooking stands, specially designed and constructed for the contest by the Board, were inspected by the guests.

WEST MIDLANDS

THE final stage in the West Midlands Competition was held on June 28 at Queen's College Chambers, Birmingham, before an audience of 200.

Mr. G. le B. Diamond (Chairman of the West Midlands Gas Board) was in the Chair with Councillor W. H. Malcolm, J.P. (Chairman of the Gas Consultative Council), and Miss O. L. Humphries (Area Home Service Adviser) in support.

AREA FINALS

Twelve area finalists have, by the time this is read, competed for the final—held at the Park Lane Hotel, London, yesterday afternoon. The presentation of prizes by H.R.H. Princess Elizabeth will be fully reported in next week's issue of the 'Journal'.

Dame Vera Laughton Mathews (Adviser on Women's Affairs to the Gas Council) presented the prizes.

Seven model kitchens, designed by the Board Publicity Section, were used by the competitors. Everything was provided for their needs—a table, a cooker to choice and all necessary utensils. The good lighting, bright curtains and colourful window scenes made each kitchen a most attractive setting.

The winners were:—*First Prize*—Mrs. B. Morris, Smethwick. *Second Prize*—Mrs. V. Fewtrell, Solihull. *Third Prize*—Mrs. D. Wright, Rugby. Consolation prizes were awarded to the other competitors.

The setting for the Wales Area Final in the Cardiff City Hall.

WEST MIDLANDS

Mr. G. le B. Diamond (Chairman of the Board) at the West Midlands Area Final. On his left is Dame Vera Laughton Mathews.

SOUTH WESTERN

The Lady Mayoress of Bristol (Mrs. R. F. Lyne) presented the prizes at the South Western Area Final at the Grand Hotel, Bristol.

EAST MIDLANDS

MORE than 600 people from places as far apart as Sheffield and Northampton watched Councillor Mrs. Upton, of Loughborough, cook her way through to first place in the East Midlands area finals at Leicester.

Miss Helen Burke (well-known B.B.C. and 'Evening Standard' cookery expert) led the judging, assisted by Miss Mary Ash (Principal of the City of Leicester Education Committee's Central Institute for Women). Summing up, she said that a remarkably high standard prevailed and the judging was very difficult. Miss Burke went on to say that in view of this very high standard it had been decided to award four consolation prizes—a first consolation of £5 and three second consolations of £3, in addition to the main prizes of £30, £20, and £10. All prizes were in the form of cash vouchers for gas appliances. The prizes were presented by the Hon. Lady Martin (wife of Sir Robert E. Martin, Chairman of the Leicestershire County Council).

NORTH THAMES

Seven competitors who had graduated from the local and divisional stages of the North Thames Gas Board Festival Fare competition battled at the Porchester Hall on June 14 for the honour of being area representative at the forthcoming national contest. Principal guest was Richard Hearne who appeared in his television rôle of Mr. Pastry, and prizes were presented by Miss Nancy Spain, the grandniece of Mrs. Beeton. Our photograph shows the platform group presided over by Mr. Michael Milne-Watson, Chairman of the North Thames Gas Board.

NORTH THAMES OFFICERS VISIT BENHAM'S WORKS

Benham & Sons, Ltd., were recently hosts to Mr. T. V. Garrud, Deputy Commercial Manager, Mr. A. C. Long, Manager, and representatives of the North Thames Gas Board, Catering Section, who visited three of the firm's factories in the Wandsworth district.

Mr. T. V. Garrud (Deputy Commercial Manager of the North Thames Gas Board) second from right in discussion with officers of Messrs. Benham & Sons, Ltd.

EACH guest received a copy of the day's programme which contained a copy of the Benham Quarterly Review, Organisation issue, giving some interesting historical developments of the manufacture of cooking apparatus from 1817, when the company was founded, to the present day. The guests were welcomed by Mr. W. L. Clarke and Mr. J. C. Morris (Directors of the company) and were divided into two parties, one of which was shown the porcelain enamelling and kitchen joinery work, while the other saw the manufacture of stainless steel apparatus and service counters.

Lunch was presided over by Mr. J. E. Benham, whom Mr. Garrud thanked on behalf of the guests, for the invitation to view a surprisingly complete and wide range of products, all of which were associated with kitchen engineering.

After lunch the parties proceeded to the main works at Garratt Lane and were shown the manufacture and final assembly of Benhams' cooking apparatus and service appliances including the "Solid-top' gas range unit, and 'Hercules' dishwashing machines. The visit ended with a short informal meeting at which questions were invited on the manufacture of cooking apparatus and kitchen planning.

Assembling 'Solid-top' Gas Ranges and Gas and steam Hot Closets at Benham's Garratt Lane Works.

Eversheds & Vignoles

Overseas representatives of Eversheds and Vignoles, Ltd., visited the Company's head office and works at Chiswick on June 26 and 27 for a conference and demonstration of recent developments.

After the visitors had been welcomed by the Joint Managing Directors, Mr. M. Vines and Mr. D. D. Walker, the first morning was devoted to a tour of the production plant. Later, Mr. C. E. Perry, Chief of the Eversheds Research Department, demonstrated developments in the design and production of 'Megger' insulation testers, earth testers and Eversheds chart recorders. Mr. W. T. Marchment, Controls Department Manager, addressed the conference on the second morning, and described the new Eversheds range of industrial process controllers.

The representatives and their wives were guests of Eversheds & Vignoles, Ltd., for a fortnight, time being allocated in the programme for visits to the British Instrument Industries Exhibition at Olympia where the Company exhibited a number of new process control instruments.

Chester Co-Partnership Ends

THE annual meeting of the Chester Gasworks co-partnership on June 29 marked the winding up of a scheme which has existed for over 50 years. At the end of the meeting at which Mr. J. H. Noble, Engineer and Manager, presided, 179 co-partners shared between them £4,770, which included 15 months' bonus at 6½% on wages and salaries.

Although the scheme launched in 1900, has now ended because of nationalisation, co-partners will still receive an annual payment, equivalent to the bonus paid in respect of the last completed year, for a maximum of 15 years, said Mr. Noble.

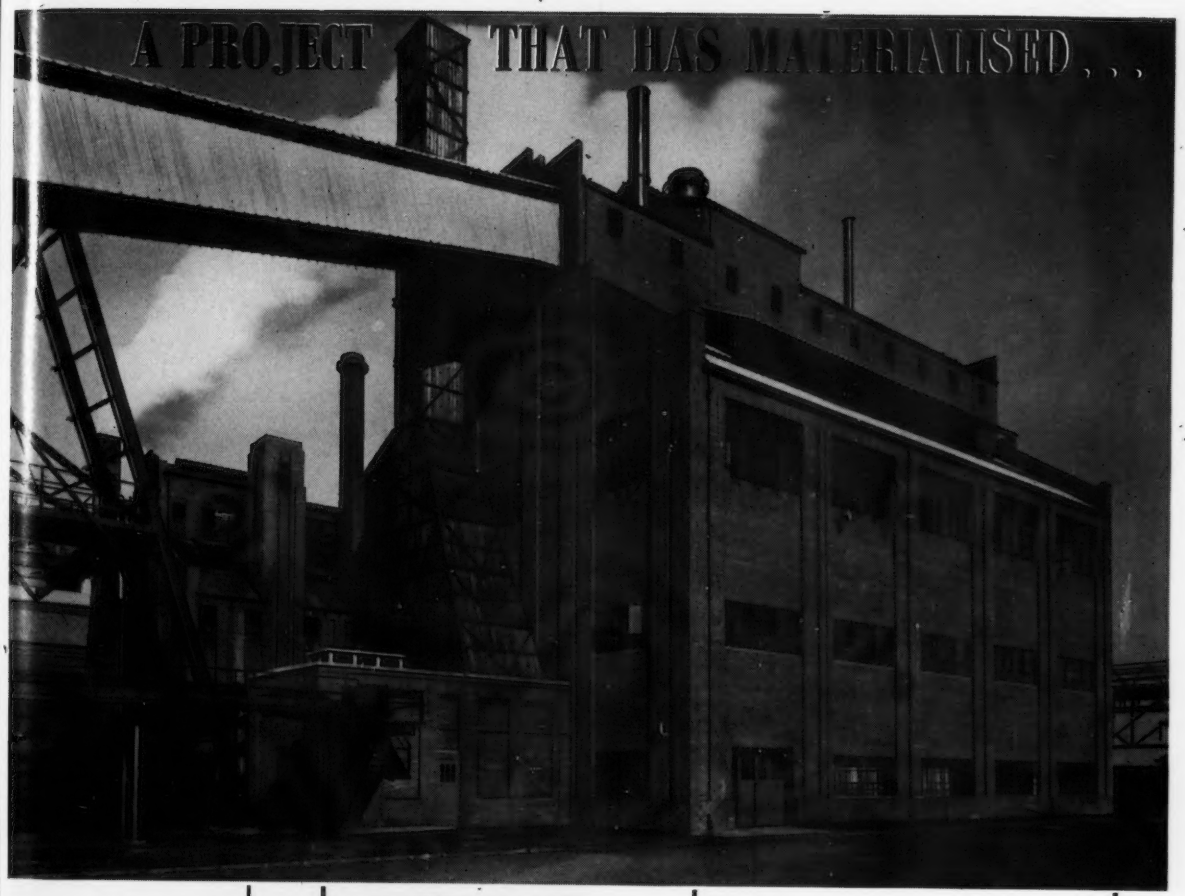
The Chester undertaking was the first provincial gas company to adopt a system of profit sharing, based on the scheme prepared by the late Mr. George Livesey, for the South Metropolitan Gas Company. Provision had been made in the Gas Act, 1948, for the Minister of Fuel and Power to provide by regulation for the continuance of co-partnership schemes until March 31, 1951. 'The time has now expired and your co-partnership scheme will cease to operate as from that date,' said Mr. Noble.

The Chairman offered thanks to all those who had worked in connection with the scheme throughout the years. Particular mention was made of Mr. T. W. Pritchard, on whom much of the work had fallen.

Thanking the Chairman, Mr. A. H. Williams said the occasion was tinged with sadness, but the creation of a compensatory scheme was largely due to the officials of the co-operative scheme who had persuaded 'the powers that be' to continue the scheme for 15 years.

The secretary, Mr. T. L. James, who is District Service Manager, said he was glad that 'at the last ditch' Mr. Noble was presiding.

The meeting ended with a vote of thanks to the Secretary, who said he had regarded his task as a labour of love.



. . . WESTON-SUPER-MARE

The New and Fourth Installation of Intermittent Vertical Chambers at the Weston-Super-Mare Station of the South Western Gas Board. The third installation is in the background.

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Africa (PTY.) LTD., Johannesburg, South Africa

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London and Southern Section

Mr. T. C. Battersby must have been gratified indeed at the splendid muster of members of the London and Southern Section of the Institution of Gas Engineers who supported him at the summer meeting (which is in effect 'Chairman's Day') on his 'home ground' at Watford on July 4.

SUMMER MEETING AT WATFORD

CLOSE on 200 members and their ladies gathered at the invitation of the Eastern Gas Board, of which Mr. Battersby is a Divisional General Manager, to participate in a programme as varied as it was interesting. In fact there was something for practically every taste—from the gas engineer who preferred a busman's holiday at a modern gasworks to the archeologist who visited one of the most ancient sites in the country—the Roman city of Verulamium. Or again, from modern industry as represented by Sun Printers, Ltd., the largest printers of illustrated journals in colour and monotone in Europe, to one of our oldest ecclesiastical foundations as represented by St. Albans Abbey.

Incidentally, the party who visited the Abbey in the afternoon was treated to both old and new, for having seen this outstanding example of Saxon and Norman architecture they had an involuntary and quite unexpected tour of one of St. Albans' latest housing estates when the coach driver took the wrong turning on the return journey.

The Watford gasworks, which was visited in the morning, is the third largest in the division. Gas making plant comprises two horizontal retort houses each of 12 beds, all equipped with Congdon standpipes. The installation now under construction embodies many features designed to give high efficiency with the best possible working conditions. The total capacity of the works is 7 mill. cu.ft. per day of coal gas and carburetted water gas.

Sun Printers, Ltd., also visited in the morning, are producers of such well-known periodicals as *Picture Post, Vogue, Housewife, Everybody's, Country Life, Readers' Digest,* and many others. They are pioneers in the development of rotary colour gravure and have the most extensive gravure process department in the world.

Luncheon Speeches

Luncheon was taken, at the invitation of the Eastern Gas Board, in the Watford Town Hall, itself one of the finest civic centres in the country. Mr. Battersby presided.

Mr. J. H. Dyde (President of the Institution of Gas Engineers) welcomed the visitors in his capacity of Deputy Chairman of the Eastern Gas Board and proposed, in a typically lively speech, the toast of the Section. The President of the Institution, he said, played many parts and his was an exceedingly pleasant one that day. A year ago they buried the old S.A.G.E.M. in the most charming and carefree manner, but on looking at their programme during the past year and on the familiar faces around him on that occasion he could only say that the new District Section was 'some progeny.' Their Chairman, Mr. Battersby, having nursed them through their first year, was now going on a similar office with the Eastern Section. The Southern Association was the pioneer of the movement for the formation of District Sections of the Institution since it was the first Association to become an integral part of the parent body. It was, he said, the largest and most influential district association, and he could affirm with every justification that the manner in which its business had been conducted throughout the year, the high standard of the technical papers presented to it and the excellence of the discussions which followed them, were worthy of the highest praise and were a source of considerable encouragement to the Institution. This was in no small measure due to the able guidance and charm of their Hon. Secretary backed by a capable management committee and the support of all the members. He hoped this happy relationship would continue in the future; he was sure it would.

A First Visit

Mr. Battersby, in responding to the toast, thanked Mr. Dyde for his support and the Eastern Gas Board for its hospitality. They regretted the unavoidable absence of Sir John Stephenson, the Chairman of the Board, but were very pleased to have Mr. Dyde with them in his stead. Among the guests he extended a special welcome to the Mayor and Mayoress and the Town Clerk of Watford. Their Association was formed 76 years ago, and this was the first time they had visited Watford or St. Albans. He had now reached the end of his year of office as their Chairman—a year which had been a most harmonious one and a great experience for him, and he sincerely thanked the committee and all the members for their support.

Luncheon was brought to a close by a happy little ceremony in the presentation to the retiring Hon. Secretary, Mr. J. M. Webber, of a cheque in token of the members' esteem and their appreciation of his work since he took office in 1945. Mr. Webber, in acknowledgement, said that everything which had been done was the result of team work, and he was very proud to have been a member of that team.

An Afternoon at St. Albans

During the afternoon there was a choice of three alternative visits at St. Albans—the gasworks, St. Albans Abbey, and the Roman site of Verulamium.

The St. Albans gasworks is the largest in the division. With plant now under reconstruction the capacity of the works is 15 mill. cu.ft. per day. Extensions now on order or planned comprise a third 3 mill. cu.ft. per day carburetted water gas set and a 4 mill. cu.ft. continuous vertical installation. This works supplies a large part of the divisional area, including the satellite towns of Hemel Hempstead, Welwyn Garden City, and Hatfield.

Those who visited the Abbey and Verulamium also found that nothing had been left undone in arranging special guides to take them round and explain the noteworthy features of these two pre-eminent examples of England's early history. A return to Watford for tea concluded a day which will long be remembered as one of outstanding interest and enjoyment.

National Joint Council for Gas Staffs

The second annual general meeting of the National Joint Council for Gas Staffs took place on June 27, and, in accordance with the constitution, the following appointments were made:—

Chairman: Councillor W. E. Webb, J.P.

Vice-Chairman: Colonel H. C. Smith, C.B.E., D.L., J.P.

Joint Secretaries: Employers' side, D. L. Hill, M.A.; Staff side, L. A. Garratt.

Lancashire Dynamo.—The registered office of Lancashire Dynamo Holdings, Ltd., is now 94, Petty France, London, S.W.1. The registered office of Lancashire Dynamo & Crypto (Mfg.), Ltd., is also 94, Petty France, London, S.W.1. This subsidiary company is now entirely responsible for the activities of the Trafford Park and Willesden works.

ROTHERHAM EXTENSIONS—

(*Concluded from p. 102*)

tions could do no better than read the Board's annual report, which was an account of stewardship second to none in the gas industry.

The Chairman of the Board, Mr. H. F. H. Jones, J.P., responding, said he was pleased to hear that Mr. Jones, his namesake, had read the Board's annual report, because although ranking about the fifth largest it was interesting to note that the public had bought more copies of their report than those of any of the other boards. The Board had been able to make more gas available where it was wanted, at the time it was wanted, and he hoped that they could look forward to even greater benefits. He hoped that the Car House works would be completed by 1954 and that ample gas would be available for all industrialists in four or five years time, at a reasonable cost.

NEW WILTON PLANT AT TONBRIDGE

ON June 28 South-Eastern Tar Distillers Ltd., of which Major A. G. Saunders is Chairman, gave a lunch party to inaugurate officially the new continuous tar distillation plant at the Company's works, Vale Road, Tonbridge. The plant was supplied by Chemical Engineering and Wilton's Patent Furnace Co., Ltd., of Horsham, and it has actually been in operation since May 16.

The capacity of the new plant is 75 tons of crude tar a day, and the system provides for the continuous production of—

Light oil	0°—120°C
Light oil	120°—170°C.
Carbolic oil	170°—200°C.
Naphthalene	200°—230°C.
Creosote	230°—300°C.
Anthracene	280° and over
Pitch	40°—75°C. K. & S.

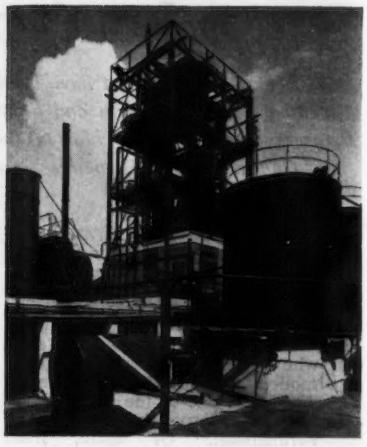
Prior to the erection of the plant the bulk of tar in the S.E. scheme was being distilled in pot stills, thus leaving a large part of the more valuable fractions in the creosote and necessitating redistillation. It was decided to install a system at Tonbridge that would not only distil tar more efficiently, and consequently save fuel, but would also allow redistillation of the pot still fractions from Canterbury and Rye in varying proportions with the tar. The new plant eliminates most of the disadvantages that have long prevailed.

The process, which combines a pipe still unit with a bubble-cap fractionating column, can distil crude tar to pitch of any reasonable degree of hardness, without danger of coking the pipe still. This is achieved by the system of high-speed recirculation through the pipe still, whereby the still is used as a reheater of the finished product and the throughput is independent of the speed of circulation. At the same time the oil products are continuously separated into a number of sharp-cut fractions.

The following points are emphasised:

1. The parts of the plant subject to corrosion are constructed of either cast iron or stainless steel.
2. Flexibility of working is obtained by the ability to operate the plant at quarter, half, or full load without detriment to the pipe still.
3. The pitch yield is reduced.
4. The plant is automatically controlled at all points, thus ensuring constant quality of products.
5. The fine-cut fractions produced are
   (a) Crude benzole.
   (a) Crude solvent naphtha.
   (c) Crude heavy naphtha containing tar acids and valuable coumarone/indene resins.
   (d) Naphthalene oil, containing approx. 45% naphthalene.
   (e) Benzole absorbing oil free from naphthalene and anthracene. This fraction can be sold as cresylic creosote to the disinfectant trade.
   (f) Heavy creosote.

   The equivalent fractions from pot still are only crude naphtha, light and heavy creosote, the first two of which require redistillation.
6. Maximum heat exchange between hot finished products and cold feed results in low fuel costs.



7. Further saving in fuel costs is effected since no redistillation of the oil products is necessary.
8. Fire risk is reduced owing to the small amount of tar in circulation—in the present case approximately 1,400 gal., whereas a pot still installation with a similar daily production would have some 16,000 gal. in process at all times.

At Vale Road Works a model of the new plant and all drawings were on view, and a thorough inspection was made under the energetic supervision of Mr. W. M. Valon (a Director of the Company), Mr. H. R. E. Clark, General Manager, and Mr. J. Collins, General Works Manager. Mr. Norman Wilton was also there.

At the lunch (at the Rose and Crown, Tonbridge) which preceded the inspection, Major Saunders was presented with a silver bonbonnière to mark the inauguration of what Mr. W. M. Valon described as the most modern tar plant

(*Concluded at foot of page 112*)

Guests at the Opening Ceremony.

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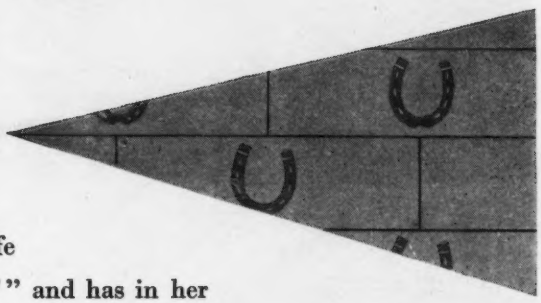

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INDUSTRIAL GAS OFFICERS VISIT WALES

THE Industrial Gas Development Committee of the Gas Council held its June Meeting at Cardiff at the invitation of the Wales Gas Board. An informal dinner was given by the Wales Gas Board to the members of the Committee at which a number of industrialists from South Wales were present.

Mr. T. Mervyn Jones, Chairman of the Board, in welcoming the Committee to its first meeting in Wales since nationalisation, mentioned information in regard to industrial consumptions in South Wales. He said that in 1938-39 Newport used 13 mill. cu.ft. of gas industrially, and in 1949-50 590 mill. cu.ft. Comparative figures for Port Talbot were 7 mill. cu.ft. and 338 mill. cu.ft. and for Pontypool 30 mill. and 312 mill. cu.ft. respectively.

Mr. H. R. Hems, Chairman of the Industrial Committee, Mr. R. B. Southall, of the National Oil Refineries and President of the Industrial Association of Wales and Monmouthshire, and Mr. J. S. Smith, Gas Division, Ministry of Fuel and Power, responded on behalf of the guests.

On the following day the Industrial Committee visited the new Abbey works of the Steel Company of Wales at Margam, where the new continuous strip mill was inspected.

The Steel Company of Wales entertained the Committee to lunch at the Royal Hotel, Port Talbot.

During the Committee's visit to the new strip mill, Mr. Blackledge and Mr. Davies, of the Coke Oven and Fuel Departments of the Steel Company, were in charge of the party.

The Industrial Gas Development Committee at Cardiff. **Left to right:** *W. H. Herbert (South Western); R. F. Hayman (North Thames); A. J. Skinner (South Eastern); W. A. Lloyd-Dodd (Northern); A. Higgs (North Eastern); J. Scraggie (Southern); E. A. K. Patrick (North Thames); H. R. Hems (Chairman of the Committee); B. E. Brockledge (Coke Oven Manager, Steel Co. of Wales); J. F. Waight (West Midlands) W. F. Edwards (General Manager and Secretary Port Talbot Undertaking); G. E. Thomas (Eastern); R. Jones (Northern); A. Bujnowski (Scottish;) T. H. Pardoe (South Western); Mr. Victory (Steel Co. of Wales); W. H. Tarn (Wales); W. F. Howell (North Western); F. Dickinson (East Midlands); K. M. Ernest (Wales).*

New Wilton Plant at Tonbridge—Concluded from page 108.

in the world. Presentation of a tankard had also been made to the Works Director, Mr. Walter Forbes, who was unfortunately absent through illness.

Major Saunders, in welcoming the visitors, expressed his thanks to Mr. W. K. Hutchison (Chairman S.E.G.B. and a Director of the South-Eastern Tar Distillers) for making the meeting possible. It was, he said, important that they should keep in touch with those for whom they worked, and he was glad to find that relationships were as cordial under the new conditions as they ever had been.

S.B.G.I. Golf.—The Society of British Gas Industries Golfing Circle will hold its autumn meeting on October 18 at Walton Heath. Mr. W. Morland Fox, Hon. Secretary, announces that entrance forms and full details of the meeting will be issued in due course.

Gas Fitter's Success as Band Conductor

Newtown (Montgomeryshire) Silver Band was established in 1880 and has continued to function without a break even through the war years. The conductor, Mr. A. R. Corfield (a fitter with the Newtown undertaking of the Wales Gas Board) took over the conductorship in 1942 and it was due to his untiring efforts that the band was kept in being during the 1939-45 war. During the war years he introduced girl members in his efforts to keep the band going. With the aid of older bandsmen and the introduction of girl instrumentalists, Mr. Corfield was able to fulfil engagements and take part in concerts held in the town during the war.

At the cessation of hostilities several returned to the band and as Mr. Corfield had been training young boys to play, the band was able to make up a good combination. The training of young members was left entirely to Mr. Corfield and he devoted four and five nights per week to the cause. Conscription has meant that his work is never ending as immediately the younger members attain the age of 18 they enter the forces. This means that the junior members are promoted to the senior band from time to time.

Visit to Granton Works.—When the Edinburgh and South East Scotland District Committee of the Scottish Gas Consultative Council paid an official visit to Granton gasworks, Mr. David Beavis, Divisional Controller, drew attention to the new oxide purifiers. Sulphuretted hydrogen absorbed by the oxide in the purification process at Granton, he said, is equivalent to the annual production of 3,000 tons of sulphuric acid, a commodition at present in extremely short supply. Coal carbonised at the present time is in the region of 331,000 tons per annum to support an annual production of 3,804 mill. cu.ft. of gas. These production figures show an increase of nearly 8% on last year.

CONSULTATIVE COUNCILS IN SESSION

Price Contrasts in East Anglia

REPLYING to a complaint raised by the Saxmundham Urban District Council that the price of gas was dearer there than at Leiston and Aldeburgh, towns of comparable size, the Eastern Gas Board stated in a letter submitted to the Eastern Gas Consultative Council at its 12th meeting at the Connaught Rooms, London, on June 26 (Alderman R. Turner presiding) that gas sold at Leiston, Aldeburgh, and Thorpeness is manufactured at Leiston and sales for the three districts are approximately 50 mill. cu.ft. per annum, whereas Saxmundham has its own small gasworks and the sales from this works are approximately 17 mill. cu.ft. per annum. Although the towns individually may be of comparable size the output of gas from the Leiston works is approximately three times greater than the output from the Saxmundham works, and Leiston is one of the few gasworks in that part of the Board's area which receives its coal direct on to the works by means of a railway siding. Saxmundham was one of the 16 places where the price of gas was reduced in September, 1950.

A letter was received from the Ministry of Fuel and Power stating that the suggestion of the Consultative Council that there should be a uniform price of coal for the gas industry and an equalisation fund set up for interest charges on capital had been noted and would be placed before the Minister for his consideration.

The Ministry had again stated that the time was not yet ripe for the amendment of the local committees scheme to allow the admittance of the Press to meetings of divisional committees. Until there was unanimity on this question by the other gas consultative councils the Minister was not prepared to amend the scheme. The Council was of the opinion that the Press should be admitted to meetings of divisional committees and will continue to advocate it.

The Chairman reported that he had written to the Suffolk Iron Foundry, Ltd., explaining how the new tariffs which came into operation on April 1 would affect them. The original complaint was that the price charged for gas used for industrial purposes was 30% dearer at Stowmarket than at Ipswich, 11 miles away. The Chairman pointed out that under the new tariff the unfavourable comparison with Ipswich still remained, for the flat rate at Stowmarket had not been raised—the industrial rate for the load in question was not so favourable as the previous rate. On the other hand, although the flat rate price at Ipswich had been increased by 2.6d. per therm, the new block rate was more favourable than the old one.

The Chairman also reported that Boulton & Paul, Ltd., of Norwich, had been in communication with him regarding the price now charged for gas used for industrial purposes. The new non-domestic tariff was not so favourable as the old, with the result that the industrial price in Norwich had considerably increased.

Letters were received from the Bury St. Edmunds Chamber of Commerce and the Borough of Bury St. Edmunds regarding the recent increase in the price of gas of 3d. per therm, 2d. of which they alleged was attributable to increased costs and 1d. for the sale of uniformity. The Borough Council appreciated that the increase in the price of gas of 2d. per therm was attributable to the increased overhead charges which the Board had to meet, but did not consider that consumers in the borough should be asked to pay a further 1d. per therm for the sake of uniformity and apart from being grossly unfair to local consumers, this action appeared to be contrary to the declared policy of the Board.

Copies of the letters had been forwarded to the Board, who had replied that the Chamber of Commerce and the Borough Council would naturally be concerned at such an increase, but felt they would appreciate the necessity for it, seeing that the accounts of the Bury St. Edmunds works showed a deficiency for the first 11 months working equal to 1.8d. per therm after meeting all charges and interest on British Gas Stock. To this figure must be added a further 1.27d. per therm to cover increases in the cost of coal, gas oil, and wages which the Board had to bear in the first few months of 1951 which could only be met by increasing the price of gas.

The matter was before the Ipswich Divisional Committee on June 22 when it was stated that the accounts for the financial year preceding vesting date had showed the Company had been run at a profit. The committee asked for fuller information as to the loss of 1.8d. per therm.

The Tariffs Committee reported that it had met the Chairman and chief officers of the Board and discussed with them the extension to the all-purposes non-domestic block rate. The Board had prepared details of the cost of producing gas at the largest works together with a statement showing how the various steps in the new tariff had been arrived at. The Committee had considered this at length and expressed satisfaction that the industrial user was not being subsidised by the domestic consumer and that the lowest price on the industrial scale—the charge for gas used in excess of 50,000 therms per quarter—was above the cost price, including interest and depreciation charges.

Northern Meter Rents

AS reported in the *Journal* of June 27 (page 921) gas charges are to be increased in the area of the Northern Gas Board in accordance with a schedule published in full in the advertisement pages of the same issue. The increases were approved at a meeting (held in private) of the Northern Gas Consultative Council. In a statement issued after the meeting the Chairman, Alderman Joseph Hoy, said the tariff structure had been retained and the Board had made slight alterations towards the equalisation of prices.

Under the recommendations certain districts would be called upon to pay increased prices, which would mean that since vesting near equalisation had only been achieved by compelling the industrial belt to carry the greater part of the financial burden. He had pressed hard to get the Board and the Chairman to examine an alternative of reducing the basic formula from 30 therms to one of 25 therms with an increase from two thirds to three quarters for the next stage. He felt that the larger consumer could with a certain amount of justice be called upon to pay this extra amount and the smaller consumer be eased to the extent of five therms in the basic figure.

Arising from their representations to the Board on the question of the supplementary charge for meter rents a small concession had been granted. They had been able to convince the Board that a maximum number of therms beyond which the charge should not be made should be conceded. In future the maximum would be 30 and the charge would be 1½d. and this concession amounted to £35,000 per year. The public lighting rebate would be increased from 17½% to 22½% which would bring within its ambit part of the increased gas charge which depended upon production costs.

Factors which had contributed to the rise in gas prices were increased wages and salaries, rail freight charges, coal prices, and increased petrol and road haulage charges.

South Eastern

AN ordinary meeting of the South Eastern Consultative Council was held on June 5, at the Goring Hotel, London, S.W.1, Mrs. D. N. Rathbone, Deputy Chairman, presiding.

Several items of correspondence from consumers, received since the last meeting, were reported as having been mainly disposed of, or in process of settlement at District Committee level. Following an approach from the Council, the South Eastern Gas Board had given consideration to and was taking steps to remedy the position with regard to shortage and type of cooking stove available on ordinary hire terms.

Approval was expressed at a recently issued statement by the Board's commercial manager on the important ques-

tion of 'freedom of choice.' The scarcity of shillings, for use with automatic meters has recently engaged the attention of the Council and certain district committees. Steps are under consideration for giving publicity to this matter. The policy of uniformity in the price of gas was discussed and deferred pending the consideration and report of district committees.

Dearer Gas in West Midlands

MR. G. le B. DIAMOND, Chairman of the West Midlands Gas Board, told a special meeting of the West Midlands Gas Consultative Council at Birmingham on July 2 that, as an interim measure pending the introduction of a unified tariff structure, the Board proposed to increase gas prices as from July 26 by 1¼d. per therm (5d. per 1,000 cu.ft.) except in certain districts where regard would be had to current levels of prices.

Mr. Diamond said that if the whole of the Board's additional expenditure had to be recovered from gas consumers a general increase of 1¼d. per therm would have been required. The number of therms of gas per ton of coal carbonised showed an improvement of one-tenth of a therm for 1951 compared with 1950. Although this increase was small and produced a saving of only £15,000, the Board was gratified that the yields had in fact been increased at a time when reductions were to have been expected from the poorer qualities of coal now being received; moreover, the increased gas yield had been accompanied by an increased coke yield.

Coke production and sales had shown noteworthy improvements. Coke produced per ton of coal was 0.05 cwt. up for 1951 (an increased production of 7,500 tons), while coke used for C.W. gas was 0.71 lb. per 1,000 cu.ft. of water gas less than in 1950 (a decreased consumption of 3,200 tons); and coke used on works (other than for C.W. gas) was down by 0.07 cwt. per ton of coal carbonised, equivalent to 10,500 tons of coke. Financial savings from these improved coke yields could be put at £70,000 annually.

On the man-power side, it was computed that in 1951 there were 43 employees (staff and manual) per million therms, compared with 44.7 in 1950. Converted to sterling, the resultant saving in wages and salaries was estimated at £165,000 yearly.

Average domestic consumption in 1950-51 was 132 therms and, at this consumption, the general increase of 1¼d. per therm would cost a consumer 13s. 9d. per annum, or 3d. per week more.

A Coventry member suggested that if industrial consumers could carry more of the burden there should be some differentiation. He thought 1¼d. was a fatuous amount if they had to take another bite in the future. It would be better to make the increase 1½d. or even 2d. if there was a prospect of their having to ask for another rise in a short time. There was not enough cushion in the proposed increase.

Mr. Diamond said there was no doubt that a larger increase would give the Board a cushion but they did not want to be above the red line because they were not a profit-making concern. They wanted to steer as level a course as possible. If they were to alter the existing tariffs and scale them up for industrialists and left domestic consumers alone they would immediately get into difficulties under the terms of the Gas Act. They could not do this *ad hoc* but they must give notice as to a proper tariff structure.

An amendment that the increase should be 1¼d. was proposed by the Coventry member. He did not think there was any fear of people changing over to other fuels because people knew the value of town gas and it could stand on its own merit.

A Nuneaton member seconded the amendment, for which there were four votes, and it was defeated by a large majority. The recommendations of the Board were then approved.

Appointments

Scottish

Provost J. R. McKay (Johnstone), Renfrew, has been appointed a member of the Scottish Gas Consultative Council.

◇ ◇ ◇

North Thames

Councilor H. D. Cowan, F.C.P.A., F.C.C.S. (Ilford) and Mrs. S. M. Cox (Brondesbury Park have been appointed members of the North Thames Gas Consultative Council.

◇ ◇ ◇

Wales

Councillor E. T. Kinsey Morgan, J.P. (Rhyader), Alderman J. H. Owen (Denbigh), Councillor T. H. Pugh, J.P. (Newton, Montgomeryshire) and Councillor T. Wynne Thomas (Aberdovey) have been appointed members of the Wales Gas Consultative Council.

Cost and Value of Publicity

ALTHOUGH letters complaining about the discontinuance of the old system of discount had been received from all over the area, the Southern Gas Consultative Council meeting at Bournemouth on June 6 decided not to recommend the Southern Gas Board to make any change. Previously industrial consumers and users of water heaters received a discount.

The Chairman, Alderman J. W. Moore, said letters had been received complaining about the discontinuance of the special tariffs. Before nationalisation, he said all sorts of discounts were being offered to induce people to install gas water heaters.

'There is no doubt,' he said, 'that at the time gas was being supplied at below cost and the domestic consumer was subsidising to some extent the industrialists and the people offered these special terms. The new tariff cancelled all previous arrangements.'

Alderman S. J. Dale (Bridport) said they could not expect everything else to go up in price and gas to stay at the same price as it was.

When members were discussing whether to issue an annual report of the Council's activities, which should be available to the public in gas showrooms, Councillor Mrs. A. F. M. Oliver, Deputy Chairman, held up a copy of the elaborately produced Gas Council publication, *The Organisation of the Gas Industry*, which sets out the structure of the Gas Council and of the area boards to divisional level, so that the members could see a page of photographs of area board members, and said 'we can still get gas without glorifying a few people who will soon be dead.'

The Chairman said the Ministry of Fuel and Power had asked for a more elaborate report on the Council's work to be made available to the public than the condensed one sent to the Ministry.

Mrs. Oliver said she believed they were losing money at the moment, and this was the sort of thing which was getting the public down. They were suffering seriously from a shortage of paper for important propaganda, and now the Council was asked to get out an elaborate annual report.

The Chairman said the Council was not responsible for the report which Mrs. Oliver had exhibited.

Councillor S. E. Vincent said the public generally were not aware of the Consultative Council's functions. 'We want them to take more interest,' he said. 'Public criticism is the kind of thing we ought to encourage.' How will the annual report be compiled, asked Alderman Mrs. Crompton. She was told—from the minutes by the Secretary.

'I shouldn't think anyone would want to read it,' she said. 'It will be far too dull.'

But the members decided to publish a report for the public, and to charge 3d. a copy for it.

Fire Services Statistics

We have received from the Institute of Municipal Treasurers and Accountants (incorporated) a copy of the *Return of Fire Service Statistics for 1949-50*. The return relates to the fire services provided by county boroughs, the county of London and joint county and county borough brigades. A similar publication, relating to counties other than London, is prepared by the Society of County Treasurers. The return differs from that published for 1948-49 in that the analysis of expenditure and income is based on the cost per 1,000 population instead of the cost per member of the brigade. The total net rate and grant borne cost per member of brigade is, however, retained. A new feature is the extension of the 'personnel' section to include pre-war establishment figures. It is apparent from an examination of these figures that the number of whole-time personnel employed by county boroughs at December 31, 1949, was almost three times the total

STORAGE OF COAL AND COKE*

By L. J. CLARK,
B.E.M., M.Sc.(Eng.), M.I.Mech.E., M.Inst.Gas E.,
A.M.I.C.E., A.M.I.E.E.,
Assistant to Chief Engineer,
and J. H. WALKER,
B.A., A.M.I.Mech.E.,
Assistant Mechanical Engineer, Beckton,
North Thames Gas Board.

L. J. CLARK.

J. H. WALKER.

THE maximum amount of coal that should be held in stock at any works immediately prior to the season of maximum demand is dependent upon several geographical and economic factors, such as—

(*a*) the size and scale of operations on the works,

(*b*) the location of the works in relation to the coal supplies,

(*c*) the means of transport from the colliery to the works,

(*d*) capacity of the unloading plant at the works, and

(*e*) the extent to which any one works may be interconnected with a group of works from the point of view of gas production and coal supplies.

In the case of the works of the North Thames Gas Board, the coal supplies have to be transported over distances ranging from 150 to 200 miles, and, of the 5.0 mill. tons annual consumption, approximately 75% is seaborne from Durham and Northumberland, and the remainder is railborne from Yorkshire and the Midlands. Of the 24 manufacturing stations of the Board, seven have each a capacity of more than 15 mill. cu.ft. per day, and collectively they produce 75% of the Board's requirements for gas. In the main, therefore, the comments in this paper will apply to fairly large works.

Dr. J. Burns, the Chief Engineer, has indicated† that the majority of the stations of the Board are at present interlinked and work is at present in hand to connect the remainder. In so far as coal supplies are concerned there is some measure of interlinking. Coal unloaded from seagoing colliers may be transferred to barges for some of the up river works, and in some cases the interchange of coal between works by means of road transport has proved expedient and economic. The disposition of the Board's works in and around London involves different sites, where land values vary considerably, and this, in conjunction with the differing layout of plant and degrees of development at the various works, have led to the practice of accepting non-uniform distribution of coal stocks to all stations. The works situated in the heart of London, which usually have the most congested sites, do, in general, carry smaller reserves of coal than the outlying stations. This in itself does not necessitate the actual interchange of coal between the works, as the effects of the different stocks can be counterbalanced by adjustment of the coal deliveries to the various works; those having the smaller stock reserves are given some preference when allocating the day-to-day coal deliveries.

The problem of handling coal to and from stock in the works of the Board has assumed greater importance during the post-war years, as with the present policy adopted by the Ministry of Fuel and Power and the National Coal Board, of allocating coal deliveries to the gas industry, the variations of stock at works from spring to autumn are now much greater than pre-war.

In the years prior to the war the former Gas Light and Coke Company made its coal contracts on the basis of about 40% delivery in the summer months and 60% in the winter months, and although these proportions were not always realised, the coal stock movements were relatively small. The average variation during the six months' periods was approximately 100,000 tons pre-war, whereas in the post-war years it was about 300,000 tons.

At the present time the Ministry of Fuel and Power requires the Board to carry a maximum stock at the beginning of the winter period of approximately 6½ weeks winter consumption. This coal stock is depleted over the winter period and the general aim is to work down to some 3½ weeks winter consumption by the spring.

Sub-Division of Storage Systems

When considering the handling machinery for dealing with movements of coal to and from stock, the frequency of turnover of the coal must be taken into account and for this purpose it is convenient to consider the functions of coal stocking under three independent heads:—

(1) A small buffer reserve to smooth out the normal day-to-day variations in the rate of supply and utilisation. This quantity usually varies between one and two days of maximum requirements.

(2) An intermediate reserve to safeguard abnormal variations in the rate of supply or usage, mainly due to transport delays resulting from adverse weather conditions, the effects of holidays, availability of wagons, ships, etc. This applies mainly to works receiving seaborne supplies, and the stocking capacity required to meet this contingency is equivalent to about one week's usage.

(3) A large store to balance the overall seasonal variation in demand, plus an appropriate safety margin for abnormal contingencies. The stocking capacity required for this purpose is equivalent to about six weeks of winter consumption.

It is evident that in cases (1) and (2) facilities should be provided for handling coal to and from stock at a high rate, as the entire demand of the works may need to be supplied by these systems at times when the normal delivery is withheld. The handling requirements for lifting and putting down coal in the main seasonal store would be at a lower rate, as it would normally only be necessary to remove the balance of the requirements over and above the average rate of supply.

At the riverside stations of the Board it has been the practice to use large storage bunkers for accommodating the day-

* Abstract of I.G.E. Communication No. 386.
† 'Some Aspects of Gas Manufacture Practice in the North Thames Gas Board' (I.G.E. Communication 385).

to-day variations of supply and demand, while it has been usual to combine functions (2) and (3) in one common main store, reserving the most accessible section of the store for function (2). The positions chosen for the three types of store are important, for the buffer and intermediate stores should be located near the point of consumption because of the high throughput, but the long-term store, with its lower rate of turnover, may be some distance away from the carbonising plant, and this distance may even be a matter of several miles provided transport to the point of usage is simple and not liable to interruption.

It is clear, from the above considerations, that the selection of the most suitable type of stocking and reclaiming plant for any particular duty is dependent upon several factors, such as—

(i) Method of delivery; (ii) annual consumption; (iii) seasonal turnover; (iv) maximum handling rates; (v) size and shape of the store; (vi) location of the site; (vii) economic aspects associated with capital, labour and power charges, etc.; (viii) type and layout of the gas-making plant; and (ix) vulnerability to weather conditions and particularly to fog and severe frost.

An analysis of the coal stock movements at Beckton over the period November, 1949, to November, 1950, indicates that the quantities of coal that would be turned over by the three storage systems set out below would be as shown in Table 1.

System (A).—The 6,000 ton coal bunker based on stock movements at the end of each day.

System (B).—A proposed new storage ground of 75,000 tons capacity, with facilities for rapid handling.

System (C).—The main storage ground of 250,000 tons capacity.

TABLE 1.

Storage System	Capacity (Tons)	Annual Turnover (Tons)	Ratio 1 = Turnover / Capacity
(A)	6,000	200,000*	33·3*
(B)	75,000	170,000	2·3
(C)	250,000	108,000	0·4

* The total throughput of this bunker is more than 1·2 mill. tons per annum but, as most of the coal is discharged within a few hours of entering th bunker, its function as a store has been assessed only on the coal that remains in the bunker for more than one day. It is appreciated that this underestimates the actual turnover, which, if based on the total throughput, would be more than 200 times its capacity, but the method used in the table brings the three systems to a common basis.

It is evident that the capital expenditure that can be justified by any particular storage system is dependent upon the total tonnage to be handled in any given season and the maximum handling rates required at any time. This justifies the use of different plants to suit particular conditions.

Bunkers

In the case of the 6,000 ton coal bunker at Beckton, it is estimated that the present-day cost of this plant, complete with conveyors, etc., would be approximately £120,000, and if the capital charges are based only on the coal stored in the bunker for more than one day (which quantity represents only 16% of the total throughput), the cost per ton withdrawn would be 8d. Labour and power amount to 1.4d. per ton, giving a total of 9.4d. per ton. If, however, the costs were based on the total coal passed through the bunker, the charge would amount to only 1.7d. per ton.

Bunkers have other important advantages when functioning as short-term buffer stores—*e.g.*, in the case of Beckton the coal is distributed to the carbonising plants by an overhead railway system, and the large 6,000 ton bunker permits six rail tracks to be run under it; over each track are 16 automatically operated doors that enable a train to be loaded without spillage in a few seconds. Reloading to lorry or barge is also facilitated by the use of bunkers, and the standard of reliability of the plant is very high.

Intermediate Storage System

At the present time the storage systems at Beckton consist of (*a*) bunkers, (*b*) heaps under viaducts, and (*c*) field heaps, each one performing an appropriate function. With the extensive developments at Beckton, however, it was considered that additional storage capacity was necessary and that a higher rate of recovery at lower cost was required for the intermediate store at present served by the viaduct systems. A suitable site, measuring 420 ft. × 335 ft., was available adjacent to the 6,000 ton bunker, and consideration was given to the most suitable type of plant to install. The site permitted the storage of over 50,000 tons at a depth of 20 ft., or 75,000 tons if compacted and built up to 30 ft. Fifty thousand tons are equivalent to about one week's usage at Beckton, but, allowing for the coal that is transferred to other works, the equivalent of one week's flow of coal through the Beckton discharging plant approaches 75,000 tons.

The following types of plant were examined and compared:—

(1) A transporter system consisting of one or two transporter bridges spanning the stock pile, with belt conveyors handling the coal to and from the heap, and grabbing cranes mounted on the bridge for reclaiming the coal from the heap to the belt conveyors.

(2) A drag scraper plant with travelling tail car and conveyors from the terminal point.

(3) A viaduct railway system based on an extension to the existing viaduct, with mechanical excavators at ground level for reclaiming from the heap to railway wagons.

(4) A simple conveyor system associated with bulldozers for moving the coal within the confines of the heap, the stocking out conveyor consisting of an overhead belt with a travelling tripper for discharging coal on to the heap, and an underground conveyor fed from three or four chutes and feeders for reclaiming.

The total capital charges and operating costs for these four systems have been determined and set down in Table 2, and, for purposes of comparison, similar figures for bunkers and field heaps operated by railway or lorries have been included.

In reviewing these figures it is appreciated that capital charges in relation to the turnover of the particular systems have a most important effect on the overall costs. In some circumstances it may be worthwhile combining systems (*a*) and (*b*), as is frequently done in the case of the power stations in the electricity industry. In general, however, the tabulated figures indicate that it is most important to keep the capital costs down to a minimum, and in the case of the intermediate store for Beckton it was decided to adopt the cheaper system using conveyors and bulldozers. This system also permits compacting of the coal when placed down in layers by the bulldozers, and by such consolidation it is anticipated that it will be possible to increase the stacking height from 20 ft. to 30 ft., and thereby increase the capacity of the store from 55,000 tons to 75,000 tons.

Other considerations that affect the choice of plant are (i) the shape of the site (*e.g.*, the transporter system is most suited to a long narrow store), and (ii) the cost of power, the marginal costs at power stations being much lower than in other industries; this favours the drag scraper, which is a heavy consumer of power.

From the coal unloading at Beckton two conveyors of 54 in. and 48 in. width serve the 6,000 ton and 3,500 ton bunkers, respectively. The proposed 75,000 tons intermediate store will be fed by an extension chute from the existing 54 in. belt over the 6,000 ton bunker, while at 48 in. belt with a travelling tripper running along the centre line of the store will be carried on a gantry 40 ft. above ground level. Distribution over the store will be performed by bulldozers. The conveyor system will have a capacity of 1,600 tons per hr., and, although the bulldozers will not be capable of dis-

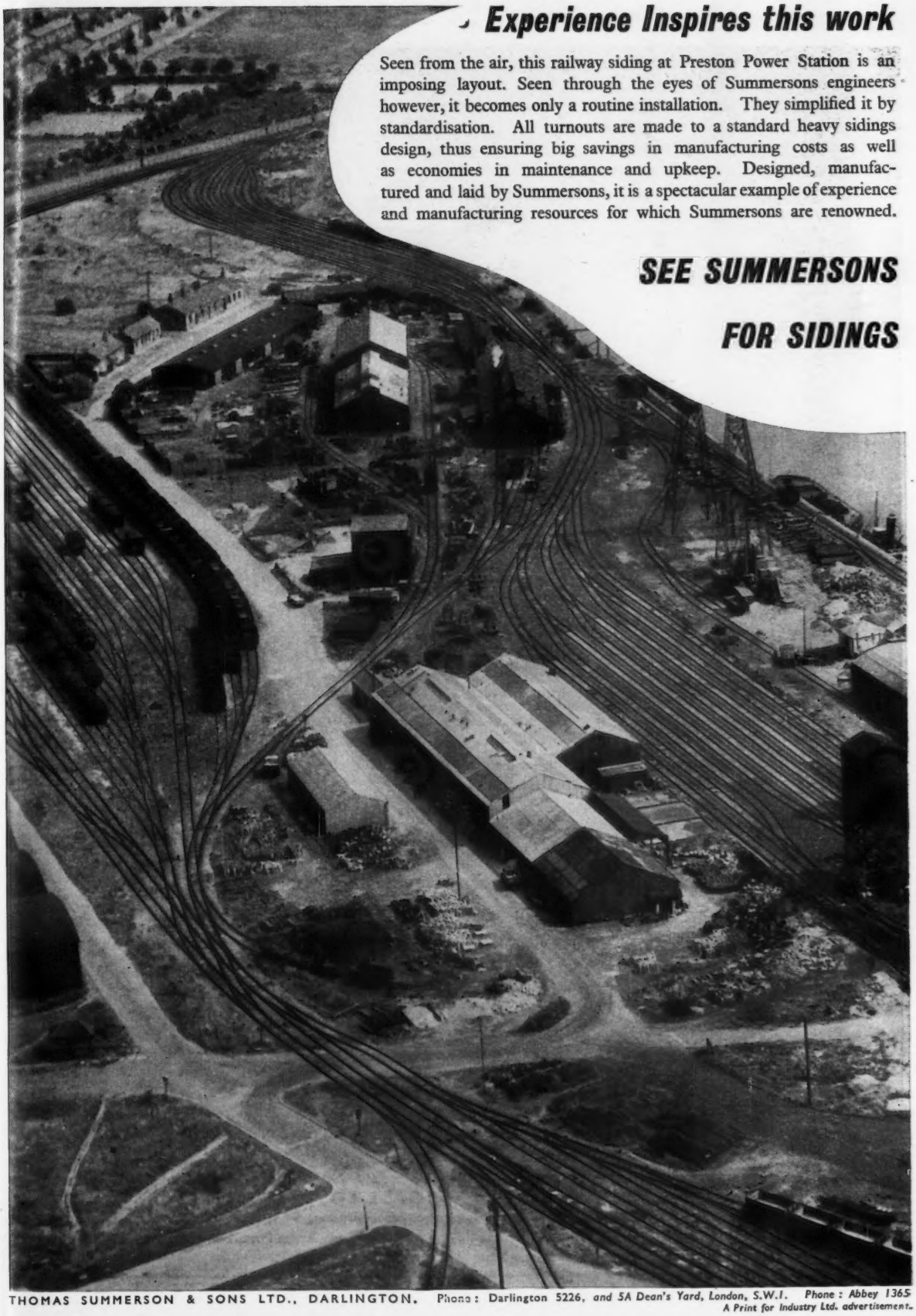

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TABLE 2.—*Capital and Operating Costs for different Systems of Handling to and from Stock.*

Type of Store	System Employed	Capacity (Tons)	Turnover Rate	Approximate Capital Cost (£)	Maximum Handling Rate (Tons per hr.) Into Stock	Maximum Handling Rate (Tons per hr.) Out of Stock	Operating Cost (Pence per Ton) Into Stock	Operating Cost (Pence per Ton) Out of Stock	Total Cost of Coal Moved Into and Out of Store (Pence per Ton)
Short-term store (*a*)	Bunkers	6,000	33	120,000	2,000	2,000	1·4	1·4	9·4
Intermediate store (*b*)	Transporter	55,000	2·3	250,000	1,600	500	5·3	5·3	31·4
	Drag scraper (three units)	55,000		180,000	1,000	1,600	5·0	5·0	23·7
	†Viaduct system	55,000		145,000	1,000	400	2·1	6·0	23·2
	¶Conveyors and bulldozers	55,000 —75,000		150,000	1,600	1,600*	2·4	2·4	18·6
Long-term store (*c*)	†Field heaps operated by railway ...	250,000	0·4	85,000	300	300	14	18	48
	‡Field heaps operated by lorries ...	250,000		Assume All Hired	100	100	21	28	49

For the long-term store, the costs also include for transport from the store to the point of consumption. In the other cases the costs relate to he plant in the immediate vicinity of the store.

* This rate of recovery could only be maintained for about 4 hr., after which it would drop to about 500 tons per hr.

† In this case it is assumed that four excavators are working in conjunction with four trains each of 16×5 ton wagons.

‡ In this case it is assumed two excavators are working in conjunction with 16 lorries.

¶ This scheme includes four bulldozers.

tributing the coal at much more than half this rate, there is ample height under the conveyor for deliveries of some 5,000 tons to be made before the bulldozers would be required to move it. The bulldozers would have the dual purpose of spreading the coal and consolidating it to allow of storage to a maximum height. The coal will be reclaimed by means of a 48 in. conveyor in an underground tunnel, fed at four points along the centre line of the heap. The maximum capacity of this system would also be 1,600 tons per hr., and, when the coal pile is built to its normal height, some 4,000 tons could be recovered immediately at this high rate with the bulldozers feeding coal to the centre at a slower rate. This facility of providing high rates for stocking out and recovery for a short period seems very desirable as it means that any one day's requirements at the station can be recovered in 2 to 3 hr., and then the bulldozers can move the next day's requirements into position at a reduced rate, which may take some 12 hr. to perform.

The coal recovered from this store can be fed to the following:—

(1) The 6,000 ton bunker for rail loading.

(2) A long conveyor feeding the coke oven plants direct.

(3) The barge-loading plant on the pier.

Another new coal unloading and storage plant is now nearing completion at the Board's Nine Elms works. In this case the 2,700 ton diesel colliers will be discharged by three ton reinforced concrete storage bunker, which may feed the 9 ton electric grabbing cranes feeding the coal to a 3,000 coal direct to the works, or to the storage ground where there will be two drag scraper units. The combined capacity of the two storage grounds will be 30,000 tons and the handling capacity at mean radius will be 350 tons per hr. on the new plant, but a somewhat lower rate for the existing drag scraper.

Systems Using Portable Plant

In this system the bunker has particular functions, for not only will it serve as a short-term buffer store for accommodating a complete ship's cargo, but it will be a most useful means for transferring coal into barges or lorries for supplying other works in the future. The drag scraper equipment was selected for the main store because one such unit already existed and the shape of the remaining site was most suited to the installation of another drag scraper.

Some interesting development work has been undertaken at Bromley station, where a new storage ground, measuring 800 ft. × 400 ft., has been brought into commission. In this case from 1 ft. 6 in. to 2 ft. of hard core was rolled in to form a hard bottom, and the whole site, which has a capacity of 100,000 tons, was developed for the use of mobile plant in the form of lorries, bulldozers, and draglines, etc.

The coal was put out to stock by lorry and bulldozer, and recovered by drag line and lorry, or by bulldozer loading directly into barge. This particular storage ground is situated alongside the dock, and on the opposite side are the three main coal unloading cranes; consequently, it is convenient to use the barges and cranes for recovery. It is intended eventually to install a conveyor alongside the dock under a travelling chute but incorporating a simple roll feeder.

Experiments were also carried out at Bromley using a D.7 tractor and 7 cu.yd. Le-Tourneau scraper, but for this size and shape of site the time lost in turning and manœuvring more than offset the gains due to the large capacity bucket; consequently, the overall handling rate was slower than the bulldozer.

Table 3 gives comparative results and costs when handling by the different systems.

TABLE 3.

Type of Plant	Duty	Distance of Travel (Ft.)	Reclaiming Rate (Tons per hr.)	Cost (Pence per Ton)
D.7 Bulldozer	Loading barges	Up to 60	240	2·2
D.7 Bulldozer	Loading barges	Up to 100	150	3·4
Le-Tourneau 7 cu. yd. Scraper and D.7 Tractor	Distributing on store	375	46	15
D.7 Bulldozer	Distributing on store	180	94	5·7
Dragline with ¾ cu. yd. bucket	Loading coal to lorries	—	80	6·4

All these costs, which are based on standard hire rates, are reasonably low, but they are not directly comparable with those in Table 2, as they only include for one operation and not the complete cycle of handling the coal into stock and reclaiming it as in Table 2. The cost of transport in lorries depends upon the distance of haul, but in the case of a lorry making, say, 25 round journeys per 8 hr. day, the cost per ton handled is only about 1s. Lorries can run directly on to the heap and tip over the end bank.

When utilising excavators or draglines for reclaiming coal it is usually quite safe to fit a bucket of approximately double the size over and above that normally fitted for excavating earth. This, of course, gives a greater output from the machines.

Other types of plant have been extensively used in the past, such as special cranes and telphers, etc., but it is doubtful, with present high costs of manufacture, whether such plants will find many economic applications in the future. The bulldozer, excavator, mobile crane and lorry, etc., would

appear to give the lowest overall costs. For the smaller works the simple mobile crane fitted with a grab is no doubt the most suitable type of plant, and, being a versatile machine, it can be employed on other duties when not required for handling coal. The costs of operating such cranes are quite low and, so long as it is not necessary to throw the coal back in two or three stages, the overall cost, including capital and maintenance charges, of putting the coal to stock and reclaiming it should be about 20d. per ton.

For works receiving railborne coal, the drag scraper system has certain advantages, as the wagon tippler unit can be incorporated at the terminal point of the store.

Storage of Coke

The fundamental principles that govern the requirements for coke and breeze storage are generally similar to those for coal, although they are influenced by a greater number of external conditions and, consequently, combine to operate in a less precise manner. Coke, also, is subject to deterioration while in stock, although it is associated entirely with degradation of particle size and consequent breeze formation. The amount of breeze made in the stocking and reclaiming operations has been known to have been as high as 10% of the coke handled, and this may represent a very considerable loss of revenue and even more than that associated with the deterioration of coal while in stock.

A large proportion of the coke supplied by the gas industry is used for space heating in one form or another and, consequently, there is a seasonal demand which may be evened out to only a small extent by the users' storage facilities. The rate at which coke is produced is also seasonal, and the curves representing both coke demand and production are approximately in phase, although the variation or swing of the demand curve is considerably greater than that of the production curve.

One factor that is assuming greater importance in this connection arises from the more extensive use of carburetted water gas for supplying the major part of the seasonal variation in the gas demand. This has a twofold effect, for not only is the ratio of winter to summer coal gas made reduced, together with its associated coke production, but more of that coke is being used during the winter months for supplying the water gas plants. Simple calculations indicate that when the proportion of carburetted water gas (at 500 B.Th.U.) reaches 50% of the day's demand, the whole of the large coke production will be consumed for gas making, and if this proportion should reach 66% of the day's demand the total net yield of all grades will be required for the manufacture of carburetted water gas.

The demand on coke for the manufacture of carburetted water gas may be influenced not only by weather conditions, but by changes in the national fuel policy consequent upon the need to conserve either coal or oil. In other directions, however, the manufacture of carburetted water gas can assist towards stabilising the coke market in so far as it balances the demand for different grades. Successful experience has been gained by the Board in gasifying broken and nut coke in carburetted water gas plants during the off-peak seasons.

Although the coke stocks follow an annual cycle, the variation of maximum stock from year to year may be very great indeed, and the primary requirement of any stocking system is a high degree of flexibility.

Apart from the main seasonal variation of demand, short-term storage for coke is necessary to cover the daily and week-end cycles. Coke is produced regularly throughout the 24 hr., but sales and distribution are usually limited to the normal day work hours. In order to provide a steady load for the screening plant, it is usual to provide an adequate bunker capacity to buffer these variations of supply and demand and permit the grades to be stored in readiness for loading at a high rate direct to transport vehicles. As the turnover rate is high, heavier capital costs are justified in the bunkers themselves in order to achieve low operating costs, high loading capacity, and a minimum of breakage.

It has been suggested that 48 hr. storage in bunkers should be adequate for this purpose, but if allowance be made for some maladjustment of hopper capacity allocated to the various grades a slightly greater total capacity will prove advantageous. In the case of the works of the Board the total bunker storage capacity, including buffer hoppers for ungraded coke, is some 18,500 tons, which represents approximately 66 hr. storage. During the abnormal conditions that occur at public holiday periods, it may be necessary to place some coke on the ground, although an export ship or a train of empty railway trucks will often provide just that small additional capacity necessary to absorb the difference.

It is usually advantageous to foster a proportion of rail trade in conjunction with road distribution, for, by this combination, the loading plant can be maintained in more continuous operation throughout the 24 hr. and at week-ends, the rail trucks serving as a convenient reserve for loading during the night hours and other off-peak periods.

The amount of short-term storage is also influenced by the ability of the transport services to make rapid day-to-day adjustments in the rate of draw off, in order to deal with the severe variations in net coke production that sometimes result from the day-to-day variation in gas demand.

Main Seasonal Storage

The main seasonal storage capacity should be about 20% of the annual production, and if the proportion of coke sold to the domestic market rises this percentage should be increased. It has not, however, been found necessary to distribute these coke stocks uniformly at all the works, and in actual fact it has proved most expedient to provide large storage grounds at only three of the works—*viz.*, Beckton, Bromley, and Southall, which in themselves have a combined capacity equivalent to some 15% of the annual production of the Board. Beckton, Bromley, and Southall are also good centres for dealing with rail trade, for they have satisfactory facilities and connections with British Railways, and, by centralised control over the allocation of rail trade orders to the various works, stocks can be balanced most conveniently.

It is the general policy at present to store only graded coke, for as such it can be reloaded at high capacity, through simple de-breezing machines, without tying up large capital sums in the main screening plant. If ungraded coke were stored it would be necessary for the screening plant to have a capacity commensurate with the maximum day's sales. Since the average annual rate of turnover in the main store rarely exceeds 50% of the total capacity, the handling and reclaiming methods should incur low capital expenditure, but be very flexible and suitable for bringing into action at short notice.

The sub-division of coke storage capacity should therefore be as follows:—

(a) *Buffer Hopper for Ungraded Coke*

Such hoppers should have a capacity of approximately 12 to 18 hr. coke production, and they serve to smooth out any irregularities in the operating cycles of the carbonising and coke grading plants and cover for night storage if necessary. They also obviate any interruption of gas making in the event of a breakdown in the coke grading plant.

It is appreciated, however, that such buffer storage may not be absolutely necessary in all cases; much depends upon the site conditions, the particular types of plant, and the means of conveyance between the carbonising and coke grading plants.

(b) *Hopper Capacity for Graded Coke*

This should be equivalent to about 48 hr. production and serve to smooth out the daily and week-end cycles

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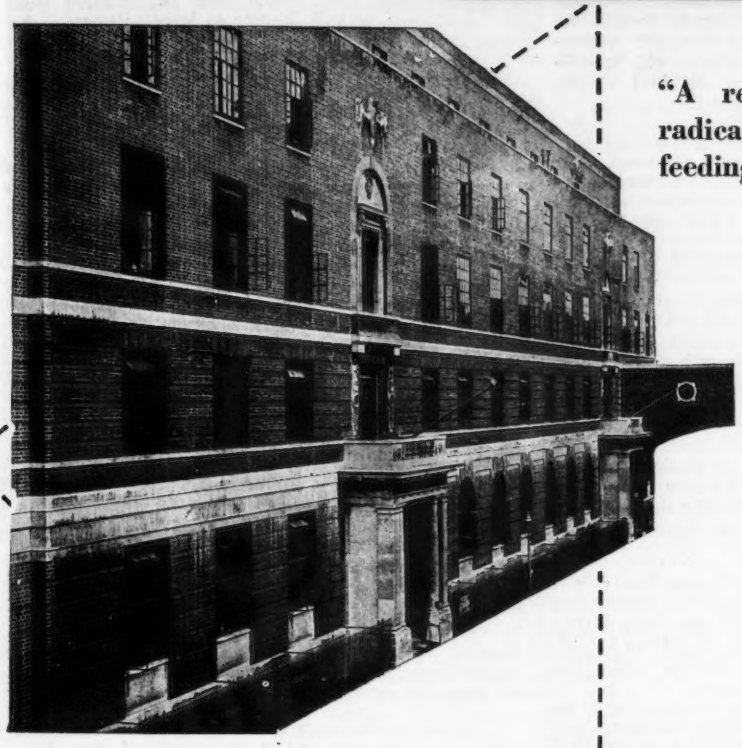

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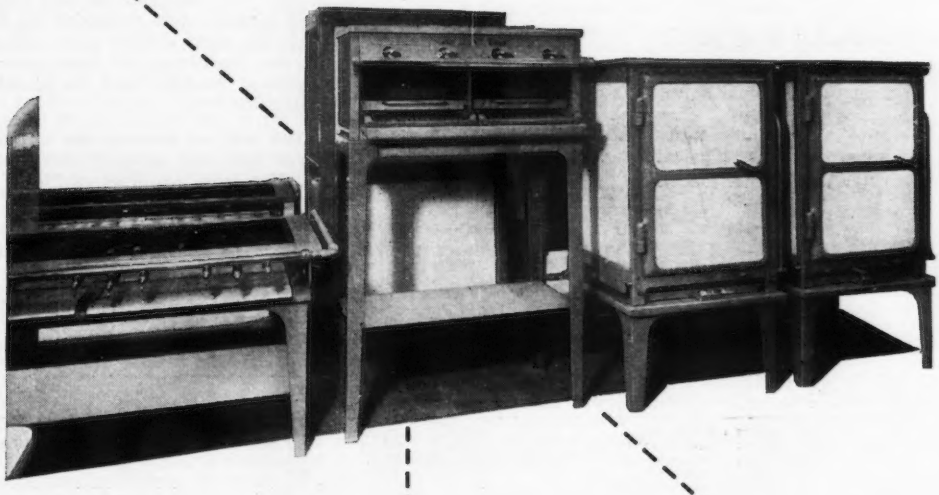

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of demand created by road traffic. The hoppers should be arranged so that they can be readily interchanged for different grades, so that the proportion allocated to any particular grade can be adjusted to suit the market. Care should be taken to minimise segregation in the bunkers, and valley angles should be sufficiently steep to prevent small coke and fines hanging up.

(c) *Main Seasonal Ground Storage for Graded Coke*
Such storage grounds should have a combined capacity equivalent to approximately 20% of the annual coke production, and the loading equipment provided should be flexible and of relatively low capital cost.

The Harmer loader is a specialised machine designed by C. G. Harmer, of the former Gas Light and Coke Company. The loading action of the machine embodies the principle of the skimmer scoop, which is gentle in its action if gathering the coke from the heap. The 7 cwt. scoop, when filled, is luffed in and discharges the coke through the two tail spouts into a receiving hopper that supplies one or two standard de-breezing and sack-loading units. The whole machine is mounted on a chassis and carried on rubber tyred wheels. It is powered by a 30 h.p. diesel engine and weighs approximately 20 tons. It is capable of loading 150 tons per day, but, with the irregular arrival of lorries, the normal output is some 100 to 120 tons per day for the single loading unit, and the time taken for loading 5 tons of sack coke to a lorry is usually less than 15 min.

It is appreciated, however, that the Harmer loader is a special-duty machine, and it should be used for dealing with base-load trade or the long term seasonal trade. For dealing with the short term seasonal load it is preferable to employ standard cranes, excavators, or mobile shovels, which can be used for other purposes when not required for coke. In order to comply with the Board's general policy that all coke sold, whether in bulk or in sacks, should be de-breezed, mechanical de-breezing units are provided at all loading points, whether they be at the storage ground or at the hoppers.

Reclaiming from Stock

The plant for reclaiming graded coke from the main seasonal store should be versatile and low in capital cost, and experience has now been gained at the Board's works with several combinations of machines and de-breezing units for this purpose. These may be summarised as follows:—

(*a*) The Harmer loader.

(*b*) A drag line excavator standing on top of the heap and feeding one or more simple and portable de-breezing units, which may be arranged for sack loading, or bulk loading to lorry or to rail. A standard drag line with a ¾ in. cu.yd. scoop has been used, but subsequently it has been found that the machine operates more satisfactorily with a special light 1¼ cu.yd. scoop. The gentle action of the scoop in sliding up the face of the heap causes very little breakage of the coke.

(*c*) Mobile shovels loading direct to a de-breezing unit.

(*d*) A standard excavator is sometimes used for loading direct to lorry or truck where rescreening may be necessary.

Simple de-breezing units have been made at Bromley works, and the initial cost varied from £400 to £650. Other units have been developed at Southall works, but in their case the practice has been to construct the de-breezing unit at a low level so that it can be fed directly by mobile shovels, and the de-breezed coke is elevated to lorry height by a mobile belt stacker.

In order to indicate the relative rate of handling and costs per ton reclaimed under the different systems, Table 4 has been prepared. The overall costs in Table 4 indicate that, under the conditions at Bromley, the drag line when feeding two portable sacking machines gives the lowest cost for sack loading to lorries, and this is followed by the mobine shovel and the Harmer loader. In practice, however, it would not be practicable to maintain the stable conditions required for the drag line to supply two loading units continuously over successive weeks. The mobile shovel, also, has limitations in respect of the type of heap and the manœuvring space required, and it is considered that the amount of coke breakage resulting from this method is likely to be higher than with the drag line or Harmer loader.

In actual practice each system possesses advantages in particular circumstances and it is considered that the most economic operation is obtained by a combination of such plants. The difference in cost per ton of coke loaded in bulk is small when comparing the different systems, and here again the most suitable plant will be determined mainly by the site conditions. All these systems, however, give a high degree of flexibility and the handling costs are in all cases reasonably low.

The costs of running coke out to the heaps by lorries is about half that incurred with the railway system when handling large quantities of 250 to 300 tons per 8 hr. shift.

TABLE 4*

Reclaiming System	Loading to Lorry, or Rail, or Barge	Approx. Time in Use per Annum	Bulk or Sack	Reclaiming Rate (Tons per Day)	Approx. Number of Men	Capital in Owned Plant	Capital Charges (Pence per ton)	Hire Charge on Machines (Pence per ton)	Operating Charge Other than Hire (Pence per ton)	Total Cost (Pence per ton)
Harmer loader	Lorry	6 months	Sacks	125	5	£7,000	7·5	—	25·3	32·8
Harmer loader	Lorry	6 months	Bulk	200	3	£7,000	4·7	—	8·9	13·6
Drag line (hired) serving 1 loading unit ...	Lorry	4 months	Sacks	125	5	£650	1·7	15	17·1	33·8
Drag line (hired) serving 2 loading units ...	Lorry	4 months	Sacks	250	9	£1,300	1·7	7·5	17·1	26·3
Drag line (hired) serving 1 loading unit ...	Lorry	4 months	Bulk	200	2	£400	1·0	9·5	1·7	12·2
Drag line (hired) serving 1 loading unit ...	Rail	4 months	Bulk	200	3	£400	1·0	9·5	3·1	13·6
Mobile shovel (hired) serving 1 loading unit...	Lorry	4 months	Bulk	120	2	£600	1·6	8·3	3·3	13·2
Mobile shovel (hired) serving 1 loading unit...	Rail	4 months	Bulk	120	2	£600	1·6	8·3	3·3	13·2
Mobile shovel (hired) serving 1 loading unit...	Lorry	4 months	Sacks	120	5	£1,500	3·9	8·3	18·1	30·3
Loading from tipping Lorry direct into rail trucks	Rail	—	Bulk	150	2	—	—	13·0	2·8	15·8
Drag line loading breeze from heap to barge	Barge	—	Bulk	250 to 300	1	—	—	7·5	—	7·5
2 Tipping lorries from hopper to heap—Bromley, 25 journeys per day	Heap	—	Bulk	150	4	—	—	13·0	3·7	16·7
6 Tipping lorries from hoppers to heap—Beckton, 16 journeys per day	Heap	—	Bulk	384	8	—	—	20·4	1·4	21·8

* Capital charges based on interest rates at 3% and a life of 20 years for Harmer loaders and 10 years for other portable loaders.
Maintenance costs from experience have been found to be similar to the depreciation rates.
For conveyance by lorry over distance of about 10 miles and tipping to heap the cost per ton ranges from 8s. to 10s.

DISCUSSION

Dr. J. Burns (North Thames) said he would deal briefly with one aspect of the paper—coal storage and coal supplies. Coal supplies were relatively limited and their coal allocations were cut with great regularity. They got out estimates for coal requirements for the year and they based the estimates on facts, and they found that their allocations were cut while price was steadily rising. The only redeeming feature of the whole situation was the charm with which the officials of the National Coal Board told them that their supplies were to be cut. They were having to carry throughout the industry about six winter weeks' consumption of stocked coal at the beginning of the winter. This was a different situation from that which obtained before the war when the supplies of coal were much more nearly related to the usage of the coal in the winter time and they did not require to carry such high stocks. It was a rather interesting fact that the Coal Board was one of the very few suppliers of a commodity who did not attempt to stock the commodity at all. They in the gas industry had to do the stocking for them; and if they looked into the matter a little further they would find that it would not make any difference whether they carried a stock or not, because the relevant factor was the transport system in the country. If they put any more load on that, the system would be likely to break down.

They were therefore committed in the future to stocking at least six to eight winter weeks of coal consumption, and consumptions were rising. Therefore, he suggested that they required to look very closely into the question of coal storage and stocking, because they could easily lose 2s. or 3s. per ton of coal by bad handling.

The authors were to be congratulated on sub-dividing the question of coal stocks into three types. With the long-term type they had low capital costs and high operating costs; with the medium-term system they had higher capital costs but they had lower operating costs; and with the very short-term type, when the coal was in and out every day more or less, they had very high capital cost and minimum operating costs. This was perhaps more relevant to the very big stations; there was, however, a parallel in each individual station throughout the country.

Mr. George E. Currier, O.B.E., (North Eastern), remarked that it was interesting to compare the costs of handling coal into and out of stock, but in doing so they must not overlook that most important factor—the relative size of the undertakings. The authors pointed out that their data were based on experience at the large works in the North Thames area. Few undertakings could afford, and indeed would require, the stocking system designed for the Beckton works. For example, at one of the largest manufacturing stations in the area of the North Eastern Gas Board, where the maximum throughput was 3,600 tons per week, against the 50,000 tons at Beckton, the maximum storing capacity was only 20,000 tons and the simplest type of handling plant was sufficient for the works needs. All coal was delivered on rail and passed to the retort houses bunkers by rotary tippler and elevator. No buffer stock was held except the loaded wagons standing in the sidings. The number so standing must be carefully controlled to avoid undue retention of wagons and the consequent imposition of demurrage charges. Wagons surplus to immediate needs were run down to the stocking ground and there unloaded by a Smith diesel crane fitted with a grab of 12 cu.ft. capacity. This process was reversed when it was necessary to recover coal from stock.

The annual rate of handling into or out of stock was 32,000 tons and the cost was estimated to be 17.27d. per ton, compared with 20d. per ton quoted in the paper for this type of equipment. All the coal was graded fuel and compacting of the stock had not been considered necessary. The works devised a comparatively cheap method of preparing a smooth hard-wearing surface for the stocking ground. Progressive demolition of old retorts provided supplies of bricks and refractory materials. This was spread over 8,600 sq. yd. of fairly level ground, roughly to a depth of 9 in., and filled with a cement grout of one part of cement and eight parts of sand. The whole was topped with 2 in. of granolithic cement composed of one part of cement and four parts of sand and granite chippings. The work was completed in sections as the ballast material became available, thus effecting a twofold economy. On the one hand the works was saved the expense of carting 3,000 tons of rubble away to a tip, work which at current charges would cost 2s. per ton. On the other hand, the use of this material as ballast enabled the undertaking to reduce the total cost of preparing the stocking ground to a figure equivalent to no more than 8s. 3d. per sq. yd. at today's rates.

The authors had referred to the pre-war practice, general throughout the industry, of purchasing coal under contracts which provided for delivery at the rate of 60% in winter and 40% in summer, with the relatively small movements in stock which this involved. Stocks were then held mainly for emergencies, such as colliery or transport stoppages, and often these stocks remained almost untouched for years.

During and subsequent to the war the system of coal allocations had provided for deliveries during summer at practically the same rate as in winter. This was illustrated by the following figures in respect of the works previously mentioned. In the summer of 1938 the coal delivered amounted to 43,000 tons and the coal consumed was 42,260 tons. In the winter of 1938-39 the coal delivered was 73,400 tons and that consumed 73,400 tons. In the summer of 1950 the coal delivered was 63,130 tons and that consumed 50,440 tons, and in the winter of 1950-51 that delivered was 66,075 and that consumed 81,540.

It had become the accepted thing for the gas industry, and other coal consumers, to put coal into stock during the summer months, not as a strategic reserve to meet emergencies due to interruptions to colliery working or coal transport, but to provide against the collieries' inability to meet demands for coal during the winter months. This aspect of coal storage warranted the most serious consideration, not only by the gas industry but by all coal consumers.

They shared with the electricity and coal industries the problems of winter peak load demands for their different fuels. In the gas industry they made every effort to solve the problem by providing additional plant capacity which operated only during the short peak demand period and at an excessive cost. In so far as the electricity industry and the domestic coal suppliers did not meet their peak load, the peak load for gas was increased. What was also becoming clear was that the burden of meeting the winter load for coal has been transferred from the collieries to the consumers. Incidentally, the gas industry had to, and did, meet peak demands for coke during the winter period.

The National Coal Board had the advantage of the economy in production costs which derived from a guaranteed straight line demand for their outputs throughout the year, while the gas industry bore the costs of the summer stocking which made this possible. A minor but costly feature of post-war coal supplies and stocking was the week-to-week fluctuation in deliveries. Although monthly allocations of coal throughout the summer and winter were practically equal, there had been many occasions in both seasons when coal put into stock one week had to be withdrawn the following week owing to falling deliveries. The works referred to was sited in the West Yorkshire coalfield and transport difficulties were, therefore, rare. Nevertheless, the average movement of coal into and out of stock in 1948, 1949, and 1950 was, as indicated previously, some 32,000 tons per annum.

At this works it was computed that the cost of carrying reserve stocks of coal was of the order of 13s. per ton. This figure included the cost of putting the coal into and taking it from stock, interest on capital, rent for stocking ground, and deterioration in the quality of the coal in the stock piles.

No doubt the National Coal Board would be confronted with difficulties in providing for peak load coal requirements, but if it was in the national interest that the N.C.B. should have more or less a straight line demand, then surely it was reasonable to expect that those consumers which assisted to this end by stocking during the summer period should receive some financial consideration. The summer house coal stocking scheme had set the precedent; the principle might now be extended to other consumers.

Mr. C. Johnson said that coal stocking was becoming an increasingly difficult problem because the coal stocking grounds were not growing at the same rate as the gasworks. In fact, with the exception of those few cases where they had new works laid down with adequate stocking ground, it was a fact that stocking grounds generally were being encroached upon by the building of new plant. So, taking the general position, the stocking ground diminished and the requirements of the gasworks increased. It was possible that gasworks requirements had increased by 50% since 1930. That tends to spotlight the difficulties of stocking and it tends to make coal stocking and de-stocking somewhat unpopular.

The general pattern of coal stocking was that they should have about 5¼ weeks' stock at the start of the winter, and, say, 2½ weeks' stock at the end of the winter. That meant a stock lift of about three weeks. He suggested that that was not very

high, and therefore they should not be alarmed at that figure, having regard to the vagaries of the weather and summer demand. The authors drew attention to the amount of capital locked up in terms of coal and coke at the maximum period of the year. He thought they would find that in a general way that represented about 10% of turnover. In terms of locked-up capital that was not high. In any case, they must have a strategic stock of coal, and they must turn it over from time to time. Just how often was a matter of local circumstance. If coal was left in stock too long, at the time when it was most urgently required the deterioration was most serious, and then the results which they were looking for would not be obtained. So the wise thing was to pick up their old stock and lay down the new one at fairly frequent intervals. When coal was cheap it required not a little courage to do this, and perhaps there were many people in the industry today who were never called upon to do this rather unwelcome task. It was one to which they were used in the old days. At the present time, the circumstances were very different from what they were in the past. The economics of the coal trade had undergone a vast change, and they had to reconcile themselves to these new conditions.

One would wish for an improvement in coal, in terms of both quantity and quality, and many of them no doubt were not entirely in agreement with the proposals of the Coal Board in regard to the planning of the industry in the foreseeable future, say, in 1960 or 1965, but they had to accept the position that the greatly increased inland requirements of coal were now a very serious matter for the coal trade and also in relation to the nation's capacity to carry the coal. Two-thirds of their coal—17 mill. tons a year—was carried by rail, and he thought that there were indications that in times of bad weather prolonged in the winter the railway capacity was considerably over-taxed. The capacity of the Coal Board or the coal trade to cope with peak demand in the winter had certainly gone. These were two important factors which pointed to the need to have a strategic stock of coal. He made these points only because he did not want coal stocking looked upon as a nuisance.

Coals deteriorated for the reasons given by the authors, but he submitted that they had very much over-estimated the degree of deterioration. This error—if it was an error—might be due to measurement. The computation of coal in stock was done by volumetric means until that stock had virtually disappeared and then they could have an absolute check. When putting coal to stock and lifting it up again one had in mind the kind of results which would be recorded, and he felt that these results were recorded without strict regard to measurement. The coal came up with a high percentage of moisture and the bulk density had changed considerably, and it was not uncommon to find, after they had said what they thought was stocked, to find they had more coal than they had previously thought. He suggested that the idea of 3½ to 5 therms a ton was very wide of the mark. He had examined the problem carefully in the laboratory and in works practice, and he thought that the true figure was something of the order of half a therm for the first 12 months and a progressively declining rate of deterioration over longer periods.

Dr. M. Barash (Coal and By-Products Officer, East Midlands Gas Board) commented that the authors naturally dealt with the subject as applying particularly to the very large works with which they were concerned. But however much they continued to integrate in the now established nationalised gas industry, it was inevitable that there would still for a long time to come be many works of medium size and of necessity quite a few small works in isolated areas. For these the problems of storage of coal and coke would still exist, even though the limitation of ground storage space might not appear so acute in the smaller works as in the larger works which were predominantly in more congested areas and on strictly circumscribed sites. There was excellent meat in the paper for these smaller undertakings, whether by direct consumption or after redistribution by the bigger brothers.

Adequate mechanisation and improvement of handling, storage, and reclamation were progressively becoming more essential as the output of works generally was steadily increasing on invariably limited boundary sites. In all too few cases had adequate provision been made for future expansion when selecting gasworks sites. In consequence, as the works expanded and more carbonising and ancillary plant was installed, storage space was encroached upon, although progressively more coal and coke storage became necessary. In the old days 12 to 16 weeks of coal stocking capacity was not considered uncommon, even in the good old days when coal was freely obtainable; nowadays the average available storage capacity appeared to be in the region of five to six winter weeks' consumption, if the coal was obtainable.

Labour and man-power limitations clamoured for mechanisation of such labour absorbing processes as stocking and reclamation.

As coke storage was essentially seasonal and coal storage had now also become forcibly seasonal—though unfortunately in inverse seasonal tempo—though it did not necessarily follow in all cases that the two storage capacities were conveniently interchangeable, in many cases the same site had to be used to a limited extent alternately for coal and coke, and it was in such cases particularly that quick and efficient handling to and from storage was essential.

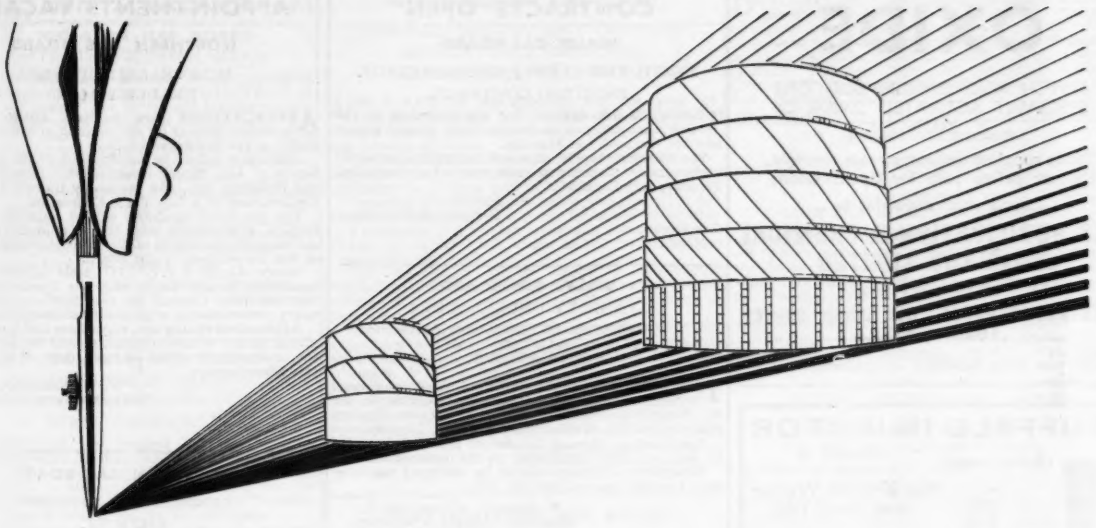
Mr. D. G. Rose (North Thames) remarked that papers on mechanical handling and storage were often so preoccupied with the subject as an end in itself that they were apt to leave out of account the needs and characteristics of the markets to which they were related. Mr. Clark and Mr. Walker had kept those aspects firmly in mind. An essential difference between gas and coke as sales problems was that coke marketing was inseparable from works affairs, especially when operating on a large scale. It was important always to bear in mind that with coke they were operating in a commodity market and so were vitally concerned with stocks. A variation of no more than 5% either way on annual tonnage could in certain circumstances represent the difference between an embarrassing surplus or an acute shortage.

The authors mentioned the many factors bearing on the demand for coke. To these he would add that a fundamental principle in the economics of coke was that, other things being equal, a relatively big change in price was necessary to influence the demand to any appreciable extent. Put another way, it could be an expensive business solving a stock problem by sacrificing it to the market, and every endeavour should be made to avoid this. He doubted whether any money had been lost during the past 20 years by stocking coke, breeze, or any other solid fuel, but he was convinced that in the same period gas undertakings in this country had lost thousands of pounds by not doing so, and the unfortunate thing was that the full effects of this practice were rarely confined to the undertakings that had recourse to it.

The authors could fairly claim that the primary requirement of any stocking system was a high degree of flexibility. Recognition of this was especially important at the present time, for there were at least two developments apart from the increasing proportion of domestic trade referred to in the paper which, unless offset in the way described, were taking away the flexibility that had existed in the past. They had also introduced new problems that called for corresponding flexibility in transport and marketing arrangements.

In the first place, the changed labour situation had almost ruled out of the question the essentially flexible method of recovering coke from stock and loading it into sacks efficiently debreezed by hand forks. Primitive though this method might have been, at least it was capable of meeting requirements, insofar as it was able to attack the heaps at many points at the same time, could cope with low heaps as well as high ones, and could be moved from heap to heap at will according to demand for the various grades.

Secondly, they had the effects of the policy of concentrating gas production at large works operated on an inter-linked system. The concentration itself tended to take production of coke further away from its market—especially the domestic one. The advantages which inter-linking gave to gas production could react adversely on coke, for instead of the coke output of a works following its old regular pattern year after year more or less in tune with the local market, it became subject to abrupt and very considerable changes that had no relation whatever to the needs of the locality. Production for sale of a substantial works could be halved or doubled overnight, eliminated altogether, or, perhaps more embarrassing from the sales point of view, suddenly started up. They had had the experience of two quite large neighbouring works completely closed for a period so far as coke sales are concerned. Not only was there the problem of withdrawing coke from other works but the additional and impossible one of educating the customer in the use of a very different type of coke. The output fluctuations had immediate repercussion on other works, especially those mainly responsible for the stocks.



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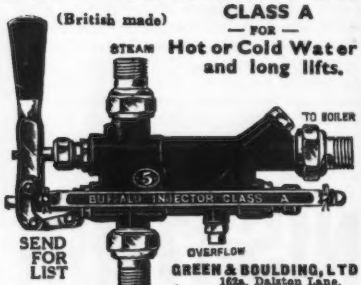

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WALES GAS BOARD

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PAINTING CONTRACT.

TENDERS are invited for the painting of the two Gasholders at the Briton Ferry Holder Station and one Gasholder at Maesteg.

Specification may be obtained on application to the undersigned. Tenders must be received not later than Monday, July 23, 1951.

G. FITTON,
Engineer & Manager.

Gas Works,
Neath.

WALES GAS BOARD

LLANELLY UNDERTAKING.
PURIFIER EXTENSIONS AND COKE GRADING PLANT—FOUNDATIONS:

TENDERS are invited for the supply and construction of reinforced concrete foundations for the Purifier Extensions and the new Coke Grading Plant at the Gas Works, Murray Street, Llanelly.

Specification, General Conditions and Drawings can be obtained, upon application, to the undersigned.

Tenders in duplicate should be delivered not later than the first post on July 31, 1951.

A. PICKARD, M.Inst. Gas E.,
Engineer, Manager & Secretary,
Llanelly Undertaking.

Gas Offices,
Murray Street,
Llanelly.
June 28, 1951.

PLANT FOR SALE & WANTED

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FOR SALE: Three-Throw H.P. PUMP by Pearn, 4in. × 6in. stroke.

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1 Bryan Donkin 50,000 cu. ft./hr. EXHAUSTER coupled to 6¼ h.p. Steam Engine. Year 1920.
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1 LIVESEY WASHER 8ft. x 8ft. x 4ft. (Firth Blakeley) 1-mil. cu. ft./day capacity. Year 1932.
1 Whessoe ROTARY SCRUBBER 7 bays dia., driven by Vertical Steam Engine, 1-mil. cu. ft./day capacity. Year 1926.
1 PREHEATER, 1-mil. capacity. Year 1931.
1 COMPRESSOR ATOMISER driven by horizontal steam engine (Bryan Donkin). Year 1932.
1 Braddocks WET STATION METER, 1-mil. cu. ft./day capacity. Year 1926.
1 Greenwood & Batley TURBINE, 21 h.p., 3,000 lbs./hr. capacity. Year 1935.
1 30 kW. GENERATOR by Electric Construction Co., 220 volts, D.C. 136 amps. direct coupled to 40 b.h.p. Sisson vertical single stage steam engine, 500 r.p.m. at 80 lbs. per sq. in. Year 1919.
1 52½ kW GENERATOR by W. H. Allen, 225 volts D.C. 233 amps. Year 1916. Direct coupled to 1 Allen Vertical 80 h.p. two-cylinder steam engine, 400 r.p.m. at 110 lbs. per sq. in. Year 1918.
1 Four Panel SWITCHBOARD for above.
1 CAST IRON TANK 33ft. x 17ft. x 3ft. 4in.; R.S.J. Supports and columns.
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1 Bryan Donkin EXHAUSTER, 30,000 cu. ft./hr. capacity, driven by horizontal steam engine, 4 h.p. Year 1926.
1 Portable Coleman Oxide Breaker driven by 6 h.p. Lister Petrol engine. Year 1942.

Inspection can be arranged by contacting Group IV Engineer at Slough Works, Telephone No. Slough 23384. Offers must be made in writing to:—The Stores Buyer, 23, Sheffield Terrace, Kensington, W.8.

APPOINTMENTS VACANT

NORTHERN GAS BOARD

SUNDERLAND DIVISION.
DRAUGHTSMAN.

APPLICATIONS are invited from suitably qualified persons for the position of DRAUGHTSMAN at the Sunderland Unit.

Applicants should be experienced in the design and layout of Gas Works construction, erection of plant and buildings, etc., and preferably trained with a Gas Undertaking or a Gas Plant Contractor.

The successful candidate will be required to pass a medical examination and the appointment will be subject to the provisions of such Superannuation Scheme as may be adopted by the Board.

Salary—Grade A.P.T. VIII, scale (£540/£620) and conditions in accordance with the Agreement of the National Joint Council for Gas Staffs. Commencing salary commensurate with qualifications and experience.

Applications stating age, experience and qualifications giving names of two referees, should be addressed to the undersigned within fourteen days of the issue of this advertisement.

W. O. KIRKWOOD,
Divisional General Manager.

Fawcett Street,
Sunderland.

NORTHERN GAS BOARD

SUNDERLAND DIVISION.
CHEMIST.

APPLICATIONS are invited from suitably qualified persons for the above position, to take over the supervision of Chemical Testing throughout the Division. Practical experience of modern Gas Works Plant operation and routine testing is essential.

Salary—Grade A.P.T. VIII, scale (£540/620), and commencing at a figure commensurate with qualifications and experience.

The successful candidate will be required to pass a medical examination and the appointment will be subject to the provisions of such Superannuation Scheme as may be adopted by the Board.

Applications stating age, experience and qualifications giving names of two referees, should be addressed to the undersigned within fourteen days of the issue of this advertisement.

W. O. KIRKWOOD,
Divisional General Manager.

Fawcett Street,
Sunderland.

NORTHERN GAS BOARD

DARLINGTON DIVISION.
CENTRAL SUB-DIVISION.
JUNIOR ENGINEER.

APPLICATIONS Are invited for the position of JUNIOR ENGINEER at the Darlington Unit of the Northern Gas Board.

Candidates should hold an Institution of Gas Engineers Ordinary Grade Certificate in Gas Engineering (Manufacture) or its equivalent, and should have practical experience in the Chemical Control of Gas Works Plant. The person appointed will be trained for the position of Shift Engineer.

The salary will be in accordance with the National Joint Council for Gas Staffs Agreement, Grade A.P.T. III, Provincial A, Scale £275 to £440 per annum. Initial placing in accordance with age and experience.

Applications, stating age, experience and qualifications with the names of two referees, should be addressed to Charles Hindle Esq., Sub-Divisional Manager, Northern Gas Board, Darlington Division, Gas Offices, John Street, Darlington not later than July 21, 1951.

F. WILSON,
Divisional General Manager.

EAST MIDLANDS GAS BOARD

NOTTS. AND DERBY DIVISION.
GAS ENGINEERING DRAUGHTSMEN.

VACANCIES exist for GAS ENGINEERING DRAUGHTSMEN in the Divisional Drawing Office, Derby.

Applicants should have had experience with either a large Gas Undertaking or a Gasworks Plant Contractor, in the design, layout and detailing of plant and equipment for the production and distribution of gas.

The commencing salary will be according to experience and ability and within the range of £500/£580 per annum, Grade A.P.T. VII of the National Salary Scales for the Gas Industry. The successful candidates will be required to pass a medical examination and to subscribe to such superannuation scheme as the Board may adopt in the future.

Applications stating age, qualifications, training and experience, together with the names of two referees, should be submitted to the undersigned not later than July 14, 1951.

K. L. PEARCE,
Divisional General Manager.

Notts. and Derby Division,
Friar Gate,
Derby.
June 25, 1951.

APPOINTMENTS VACANT (ctd.)

EAST MIDLANDS GAS BOARD

ACCOUNTANT—LEICESTER GROUP.

APPLICATIONS are invited from qualified Accountants for the post of ACCOUNTANT at the Leicester Group. The duties will involve responsibility for a substantial measure of re-organisation and the post offers scope for a man of initiative. The commencing salary will be not less than £950 per annum.

The successful candidate will be required to pass a medical examination and the appointment will be subject to the provisions of such Superannuation Scheme as may be adopted by the Board.

Applications stating age, experience, qualifications, present appointment and salary together with the names of two referees, should be sent to the undersigned, to be received not later than July 23, 1951.

A. GWYNNE DAVIES,
Secretary.

Beverley House,
University Road,
Leicester.

EAST MIDLANDS GAS BOARD

LINCOLNSHIRE DIVISION.

BOSTON GROUP.

STAFF VACANCY.

APPLICATIONS are invited for the position of TECHNICAL ASSISTANT. Applicants should be familiar with control of all gasworks plant, and should possess a Higher Grade certificate in Gas Engineering (Manufacture). Experience of Woodall-Duckham vertical retorts will be an advantage.

The appointment will be made within the national grade A.P.T. V (£425-£505), and will be subject to satisfactory medical examination and to membership of such superannuation scheme as may be adopted by the Board.

Applications stating age, qualifications, training and experience, together with the names of two referees, should be sent to the undersigned to arrive not later than July 24, 1951.

B. CLARKE,
Divisional General Manager.

East Midlands Gas Board,
Belle Vue House,
Carline Road,
Lincoln.

EAST MIDLANDS GAS BOARD

DEPUTY INDUSTRIAL RELATIONS OFFICER.

APPLICATIONS are invited for the appointment of DEPUTY INDUSTRIAL RELATIONS OFFICER at Area Board Headquarters, Leicester.

The person selected will be required to have a wide knowledge of personnel management generally and, in particular, of the principles and methods of determining the salaries, wages and conditions of employment of employees in a large scale organisation. Preference will be given to persons who have had practical experience in the conduct of joint negotiations on an Area or National basis and who have a knowledge of the Gas Industry.

The commencing salary for the appointment will be not less than £850 per annum.

The appointment will be subject to any superannuation scheme which may be adopted by the Board and the successful candidate will be required to pass a medical examination.

Applications giving details of age, education, qualifications and experience together with the names of two referees should be submitted to the undersigned to reach him not later than July 31, 1951.

A. GWYNNE DAVIES,
Secretary.

Beverley House,
University Road,
Leicester.
July 6, 1951.

WEST MIDLANDS GAS BOARD

WOLVERHAMPTON & DISTRICT DIVISION.

STOURBRIDGE DISTRICT—

TECHNICAL ASSISTANT.

APPLICATIONS are invited from suitably qualified persons for the above post.

The successful candidate will be required to have experience of general Gas Works routine testing, including Retort House pyrometry. Experience in the control of Vertical Retort Settings would be an advantage.

The salary for the post will be not less than £425 per annum on commencement rising by annual increments to a maximum of £505 per annum, which is in accordance with Grade V of the salary scales of the National Joint Council for Gas Staffs.

The successful candidate will be subject to such Superannuation Regulations as the Board may, in due course, adopt, but any existing superannuation rights in the Gas Industry would be maintained.

Applications stating age, qualifications and experience together with details of present and previous appointments and the names of two referees, should be addressed to Mr. F. C. Briggs, Divisional Manager, West Midlands Gas Board, Wolverhampton and District Division, Kensington House, Bath Street, Dudley, Worcs., to reach him not later than fourteen days after the appearance of this advertisement. Applicants are requested to quote ref. T.P.3, when replying to this advertisement.

F. H. CURETON,
Secretary.

WEST MIDLANDS GAS BOARD

WALSALL AND DISTRICT DIVISION.

ACCOUNTANCY ASSISTANT

(CONSUMERS' ACCOUNTS).

APPLICATIONS are invited for the post of ACCOUNTANCY ASSISTANT (Consumers' Accounts) at the Divisional Headquarters of the Walsall and District Division.

Applicants should have a sound knowledge of accountancy principles and experience in mechanised accounting, preferably in a Public Utility Undertaking.

The salary for the post will be not less than £570 per annum on commencement, rising by annual increments to a maximum of £670 per annum, in accordance with Grade IX of the salary scales of the National Joint Council for Gas Staffs.

The appointment will be subject to such superannuation regulations as the Board may, in due course, adopt, and the successful candidate may be required to pass a medical examination.

Applications giving details of age, qualifications and experience, together with the names of two referees, should be addressed to Mr. E. Hardiker, Divisional Manager, West Midlands Gas Board, Walsall and District Division, Walsall Factory Estate, Tame Bridge, Walsall, to reach him not later than fourteen days after the appearance of this advertisement. Applicants are requested to quote ref. T.P.3, when replying to this advertisement.

F. H. CURETON,
Secretary.

WEST MIDLANDS GAS BOARD

BIRMINGHAM DIVISION.

ASSISTANT COST ACCOUNTANT—

BIRMINGHAM DISTRICT.

APPLICATIONS are invited from suitably qualified persons for the post of ASSISTANT COST ACCOUNTANT for the Birmingham District.

The salary for the position will be not less than £540 per annum, rising by annual increments to a maximum of £620 per annum, in accordance with Grade VIII of the salary scales of the National Joint Council for Gas Staffs.

The duties of the post include routine supervision of the costing system, the preparation of cost statements, revenue and capital budgets, the collation of certain statistical information and investigation into specific problems under the general direction of the Cost Accountant.

Knowledge of the Gas Industry and the possession of a professional qualification will be advantageous.

The successful candidate may be required to pass a medical examination and to subscribe to such scheme of superannuation as the Board may, in due course, adopt.

Applications, stating age, qualifications and experience accompanied by the names of two referees should be addressed to Mr. J. E. Wakeford, Divisional Manager, West Midlands Gas Board, Birmingham District, Edmund Street, Birmingham, 3, to reach him not later than fourteen days after the appearance of this advertisement. Applicants are requested to quote ref. T.P.3, when replying to this advertisement.

F. H. CURETON,
Secretary.

SOUTH WESTERN GAS BOARD

NORTHERN DIVISION.

STATION ENGINEER,

STAPLETON ROAD WORKS, BRISTOL.

APPLICATIONS are invited for the above appointment at a commencing salary of £1,250 per annum.

The Stapleton Road Works is the major Station of the Bristol Sub-Division and at present has a manufacturing capacity of 9 million cu. ft. per day of Continuous Vertical, Horizontal and Producer Gas, which is being extended by the installation of new plant due for completion next year and comprising West's Vertical Carbonising Plant, Coal and Coke Plant, Wet and Dry Purification Plant, Power Plant, Gasholder, etc., to 16 million cu. ft. per day.

A house and garden is available on the Works, rent free.

Applicants should hold high professional qualifications with experience of the control of large Works and be accustomed to the control of Works Staff and labour. Constructional and Power Plant experience, together with a wide knowledge of plant installation and maintenance will be a necessary qualification.

Age preferably between 30 and 45.

The successful applicant will be required to pass satisfactorily a medical examination and shall subscribe to any scheme of superannuation which the Board may introduce in the future.

Applications giving details of training, qualifications and experience, together with the names of two referees should be addressed to the undersigned and delivered not later than Saturday, July 28, 1951.

JAMES CARR, M.B.E.,
General Manager,
Northern Division.

South Western Gas Board,
Radiant House,
Bristol, 1.

DRAUGHTSMEN for contractors manufacturing Gas Works and Coal Tar Products plants. Capable of arranging and detailing vessels and pipework. Five-da y week of 38½ hours plus overtime. Permanent position offered at A.E.S.D. London rates. Canteen facilities. Expenses paid for interview. Apply:—Chemical Engineering & Wilton's Patent Furnace Co. Ltd., Horsham, Sussex.

WALES GAS BOARD

MILFORD HAVEN &
NEYLAND UNDERTAKING.

APPOINTMENT OF
GAS DISTRIBUTION FOREMAN.

APPLICATIONS are invited for the position of WORKING DISTRIBUTION FOREMAN to the Milford Haven and Neyland Undertaking of the Wales Gas Board. Particulars and Form of Application are obtainable from the Manager of the Undertaking, Town Hall, Milford Haven, Pembrokeshire, to whom applications must be sent not later than July 21, 1951.

The post is Graded A.P.T. V (B), *i.e.* £410-£490 per annum, and a two bedroom "pre-fab." bungalow is available at an inclusive rent of 18s. 4d. per week.

NORTH EASTERN GAS BOARD

TINGLEY NEW GAS WORKS.

TECHNICAL ASSISTANTS.

APPLICATIONS are invited for the appointment of two TECHNICAL ASSISTANTS at the above Works. The salary will be within Grade VII, Provincial 'A' of the A.P.T. Scales for the gas industry (£500-£580 per annum). In some circumstances it may be possible to make available housing accommodation.

Applicants should hold the Higher Grade Certificate in Gas Engineering (Manufacture) of the Institution of Gas Engineers and have experience in plant operation and control of labour.

The appointments will be subject to such Superannuation Scheme as the Board may adopt and the successful applicants passing a medical examination.

Applications stating age, experience and training together with the names of two referees should be addressed to the Grid General Manager, North Eastern Gas Board, West Yorkshire Gas Grid, Grid Control Office, Wheldon Road, Castleford, not later than July 21, 1951.

J. C. GARDNER,
Secretary.

Bridge Street,
Leeds, 2.
June 29, 1951.

NORTH EASTERN GAS BOARD

TINGLEY NEW GAS WORKS.

WORKS MANAGER.

APPLICATIONS are invited for the position of WORKS MANAGER at the above Works which will produce 7 million cubic feet of gas per day in Woodall-Duckham Intermittent Vertical Chambers.

Applicants should have had extensive experience in the control and operation of large gas making installations and anciliary plant.

The commencing salary will be not less than £850 per annum and the appointment will be subject to such Superannuation scheme as the Board may adopt and the successful applicant passing a medical examination. In some circumstances it may be possible to make available housing accommodation.

Applications stating age, experience and training together with the names of two referees should be addressed to the Grid General Manager, North Eastern Gas Board, West Yorkshire Gas Grid, Grid Control Office, Wheldon Road, Castleford, to reach him not later than July 21, 1951.

J. C. GARDNER,
Secretary.

Bridge Street,
Leeds, 2.
June 29, 1951.

NORTH EASTERN GAS BOARD

ENGINEERING ASSISTANT.

AREA HEAD OFFICE, LEEDS, 2.

APPLICATIONS are invited from Engineers trained as Draughtsmen for the above position, at a commencing salary within Grade A.P.T. IX (£570-£670), the point of entry to be determined by qualifications and experience.

Preference will be given to candidates of Higher National Certificate standard, with experience in the design and repair of riveted and welded gasholders. Experience of erection and examination, and a knowledge of site procedure will be an advantage.

The successful applicant will be required to pass a medical examination and to subscribe to such superannuation scheme as the Board may adopt.

Form of application may be obtained from the Chief Engineer, at the address below, and should be returned not later than fourteen days after the date on which this advertisement appears, quoting reference number G/J.2.

J. C. GARDNER,
Secretary.

Bridge Street,
Leeds, 2.
July 3, 1951.

(*Classified advertisements continued on Supplement* 4)

APPOINTMENTS VACANT (ctd.)

NORTH EASTERN GAS BOARD

KEIGHLEY DISTRICT.
SHOWROOM SUPERINTENDENT.

APPLICATIONS are invited for the position of SHOWROOM SUPERINTENDENT to take charge of the Keighley and Haworth Showrooms. Applicants should possess the Institution of Gas Engineers' Certificate in Gas Salesmanship and Consumer Service and have practical experience in selling and the supervision of staff.

The appointment will be subject generally to the conditions of service as agreed by the National Joint Council for Gas Staffs from time to time and the commencing salary will be within Grade A.P.T. V (£425-£505).

The successful applicant may be required to pass a Medical Examination and subscribe to such scheme of superannuation as the Board may adopt.

Applications, giving personal details together with record of training, experience and qualifications and the names of two referees, should be forwarded to the District Engineer & Manager, Cook Lane, Keighey, within fourteen days of the publication of this advertisement.

C. A. NEWHAM,
Group General Manager.

NORTHERN GAS BOARD

MIDDLESBROUGH DIVISION.
HOME SERVICE ADVISER.

APPLICATIONS are invited for the above appointment. Applicants should be able to lecture and demonstrate to audiences. They should be possessed of a recognised diploma in domestic science and have a practical experience in the use of Gas Cookers. Candidates should be capable of advising and demonstrating to consumers in the home. Canteen experience would also be an advantage.

The salary will be £340, rising to £404 per annum by yearly increments of £16.

Applications giving full details of age, training, qualifications, and experience together with the names of three referees should be delivered to the undersigned, as soon as possible.

JOHN W. PALLISTER,
Divisional General Manager.

Gas Works,
Commercial Street,
Middlesbrough.
July, 1951.

EXPERIENCED GASHOLDER ERECTION FOREMEN required for Contracts of all sizes. Applications stating age, experience and salary required to—Robt. Dempster & Sons Ltd., Rosemount Iron Works, Elland, Yorks.

THE GAS COUNCIL

APPOINTMENT OF STATISTICIAN.

THE GAS COUNCIL invite applications for the appointment of STATISTICIAN, who will be responsible, under the Chief Accountant, for the statistical work of the Council. Candidates must possess both high qualifications in economics and statistics and also practical experience of the application of statistical principles to industry and commerce. The appointment will carry with it membership of a pension scheme, and the successful candidate will be required to pass a medical examination. Commencing salary will be not less than £1,500 a year. Applications, giving full particulars of qualifications and experience, should reach the undersigned within one month of the publication of this advertisement.—F. G. Brewer, Secretary, The Gas Council, 1, Grosvenor Place, London, S.W.1.

SCOTTISH GAS BOARD

LANARKSHIRE GROUP.
CONSTRUCTIONAL ENGINEERING ASSISTANT.

APPLICATIONS are invited from suitably qualified persons for the position of CONSTRUCTIONAL ENGINEERING ASSISTANT.

The successful applicant will be responsible for the preparation of specifications, and supervision of drawing office and site work from planning stage to completion, covering generally Works engineering projects, construction, and services.

Applicants are required to possess the Higher Grade Certificate in Gas Engineering (Manufacture), or Higher National Certificate (Mechanical) or (Civil), or equivalent qualification, and have had considerable experience in Gasworks practice, or with a contractor specialising in constructional engineering.

The salary scale will be A.P.T. XI £645 to £770 per annum, and placing on the scale will be in accordance with experience and qualifications.

The successful candidate will be required to pass a medical examination and will be subject to the provision of any superannuation scheme which the Board may introduce.

Applications stating age, qualifications, present position and previous training and experience, together with the names of not less than two referees should reach the undersigned within fourteen days of the appearance of this Notice.

FRED R. MITCHELL,
Group Manager.

Gas Offices,
Uddingston,
Lanarkshire.
June 26, 1951.

SOUTH EASTERN GAS BOARD

KENT COUNTY DIVISION.
GAS ENGINEERING DRAUGHTSMAN.
TUNBRIDGE WELLS GROUP.

APPLICATIONS are invited for the above-mentioned position.

Applicants must have had previous Drawing Office experience in the Gas Industry or with Gas Works Plant Contractors.

The commencing salary will be according to qualifications and experience, and will be within Grade VIII of the National Salary Scales (Provincial 'A') in respect of Administrative, Professional and Technical Staff (£540-£620 per annum).

Applications in writing (quoting reference V.10/170) giving age, present occupation, experience, qualifications, etc., should reach the undersigned not later than fourteen days after the publication of this notice.

R. J. MCCRAE,
Personnel Manager.

Katharine Street,
Croydon.

NORTH WESTERN GAS BOARD

WIRRAL GROUP.
DISTRICT SERVICE MANAGER—
ELLESMERE PORT DISTRICT.

APPLICATIONS are invited for the above position at a salary within Grade A.P.T. IX of the National Salary Scales (£570-£670 per annum).

The successful applicant will be responsible to the Group Sales and Service Officer for all aspects of Consumer Sales and Service, including the control of Gas Fitting, Maintenance and Showroom Staff.

The successful applicant may be required to pass a medical examination and to subscribe to such scheme of superannuation as the Board may adopt.

Detailed applications, together with the names and addresses of two referees, should reach the General Manager, North Western Gas Board (Wirral Group), Gas Offices, Hind Street, Birkenhead, within fourteen days of the publication of this advertisement.

NORTH WESTERN GAS BOARD

BURNLEY-COLNE GROUP.
TECHNICAL ASSISTANT—
BRIERFIELD WORKS, NELSON.

APPLICATIONS are invited for the position of TECHNICAL ASSISTANT at the Brierfield Gas Works, Nelson, at a salary within Grade A.P.T. VI of the National Salary scales (£455-£535 per annum).

Candidates should possess the Higher Grade Certificate of the Institution of Gas Engineers and preferably should have experience in the control of Vertical Retorts and Carburetted Water Gas Plants.

The successful applicant may be required to pass a medical examination and to subscribe to such scheme of superannuation as the Board may adopt.

Applications, appropriately endorsed, and giving personal details, particulars of training, qualifications and experience together with the names and addresses of two referees, should reach the General Manager North Western Gas Board (Burnley-Colne Group), Parker Lane, Burnley, not later than 14 days after the publication of this advertisement.

NORTH WESTERN GAS BOARD

LIVERPOOL GROUP.
DEPUTY CHIEF CHEMIST.

APPLICATIONS are invited for the position of DEPUTY CHIEF CHEMIST in the Liverpool Group.

Applicants should hold a Science Degree or equivalent qualification and should have had extensive experience of the scientific aspect of Gas Manufacture and Fuel Chemistry.

The salary will be £900 per annum, and the successful applicant may be required to pass a medical examination and subscribe to such superannuation scheme as the Board may adopt.

Application should be made by letter to the Chief Personnel Officer, North Western Gas Board (Liverpool Group), Radiant House, Bold Street, Liverpool, 1, and should be delivered within fourteen days of the publication of this advertisement.

NORTH WESTERN GAS BOARD

LIVERPOOL GROUP.
DEPUTY WORKS MANAGER.

A DEPUTY WORKS MANAGER is required in the Liverpool Undertaking for appointment in the first instance at the Garston Works, which has a nominal capacity of 18 millions per day and will be increased to 30 millions per day in the next five years.

Applicants should be thoroughly experienced in modern, large scale Gas Works practice and Engineering Construction. A high standard of technical qualification will be called for.

The salary will be £900 per annum and the successful applicant may be required to pass a medical examination and subscribe to such superannuation scheme as the Board may adopt.

Application should be made by letter to the Chief Personnel Officer, North Western Gas Board (Liverpool Group), Radiant House, Bold Street, Liverpool, 1, and should be delivered within fourteen days of the publication of this advertisement.

NORTH WESTERN GAS BOARD

WIRRAL GROUP.
ENGINEERING DRAUGHTSMAN.

APPLICATIONS are invited for the position of ENGINEERING DRAUGHTSMAN at Group Headquarters.

Applicants should preferably have had experience in a Gas Undertaking or with a Gas Plant Contractor and be capable of preparing scheme drawings and detailed drawings in connection with the development of gas works, and the maintenance of gas production and ancillary plant. Experience in the design and layout of steam, electricity and water services would be an advantage.

The salary will be within the range of Grade A.P.T. VII of the National Salary Scales (£500-£580 per annum) according to qualifications and experience.

The successful applicant may be required to pass a medical examination and to subscribe to such scheme of superannuation as the Board may adopt.

Applications giving personal details, particulars of training, qualifications and experience, together with the names and addresses of two referees should reach the General Manager, North Western Gas Board, Wirral Group, Hind Street, Birkenhead, within fourteen days of the publication of this advertisement.

NORTH WESTERN GAS BOARD

SOUTH LANCASHIRE GROUP.
HOME SERVICE ADVISER.

A VACANCY has occurred for a HOME SERVICE ADVISER, who will be based on the St. Helens Undertaking of the South Lancashire Group and who will be required to travel among the other Undertakings within the Group at the direction of the Group Sales and Service Officer. Applications are invited for the position at a salary within Grade A.P.T. V (female) of the National Salary Scales (£340-£404 per annum).

Candidates should hold a qualification in Domestic Science and have experience in the organisation of cookery demonstrations, lectures and district home service calls.

The successful applicant may be required to pass a medical examination and to subscribe to such scheme of superannuation as the Board may adopt.

Applications, appropriately endorsed, giving personal details, particulars of training, qualifications and experience, together with the names and addresses of two referees should reach the General Manager, North Western Gas Board (South Lancashire Group), Radiant House, St. Helens, not later than fourteen days after the publication of this advertisement.

NORTH WESTERN GAS BOARD

BLACKBURN GROUP.
SHIFT ENGINEERS—
GREENBANK WORKS, BLACKBURN.

APPLICATIONS are invited for the above appointments.

Applicants should have practical experience of the control and working of Glover West Continuous Vertical Retorts and C.W.G. Plants, and be capable of supervising general Gas Works plant operation.

The appointment will be subject generally to the conditions of service as agreed by the National Joint Council for Gas Staffs from time to time, and the commencing salary, which will be according to ability and experience, is within the range of Grade A.P.T. VII of the National Salary Scales (£500-£580 per annum).

The successful applicant may be required to pass a medical examination, and to subscribe to such scheme of superannuation as the Board may adopt.

Applications, giving age, details of qualifications and experience, together with the names and addresses of two referees, should be forwarded to the General Manager, North Western Gas Board (Blackburn Group), Cardwell Place, Blackburn, within fourteen days of the publication of this advertisement.

NORTH WESTERN GAS BOARD

BLACKBURN GROUP.
CARBONISING SUPERINTENDENT,
GREENBANK WORKS—BLACKBURN.

APPLICATIONS are invited for the above position.

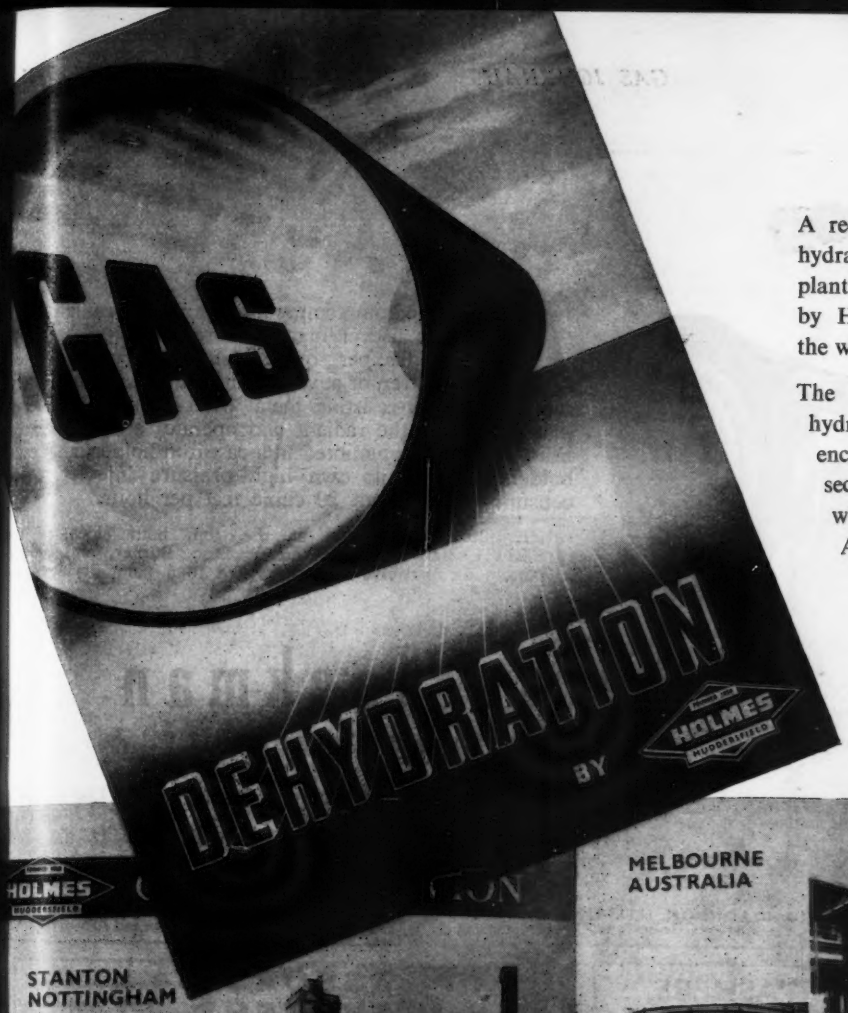
The successful applicant will be responsible to the Station Engineer for the supervision and technical control of a Glover West Continuous Vertical Retort Plant (nominal capacity 6 million cu. ft. per day), together with ancillary plant.

Applicants should possess the Higher Grade Certificate (Gas Engineering—Manufacture) of the Institution of Gas Engineers, or its equivalent.

The commencing salary will be within Grade A.P.T. VIII of the National Salary Scales (£540-£620 per annum) according to experience and qualifications.

The successful applicant may be required to pass a medical examination and to subscribe to such scheme of superannuation as the Board may adopt.

Applications, suitably endorsed, giving personal details, particulars of training, qualifications and experience, together with names and addresses of two referees, should reach the General Manager, North Western Gas Board (Blackburn Group), Cardwell Place, Blackburn, not later than twelve days after the publication of this advertisement.



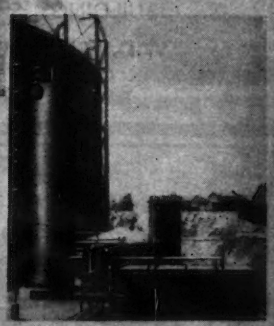
A recent publication on Gas Dehydration illustrates some of the plants designed and manufactured by Holmes, operating throughout the world.

The wide adoption of Gas Dehydration by the Industry has encouraged the printing of this second book (Brochure No. 38) which is available to Gas Authorities on Request.

HOLMES HUDDERSFIELD

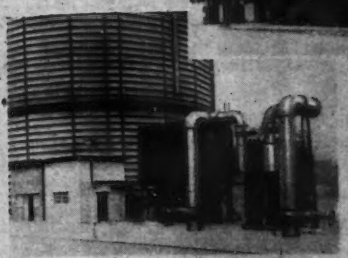
STANTON
NOTTINGHAM

LEA BRIDGE
LONDON



SCRANTON
AMERICA

MELBOURNE
AUSTRALIA



ROTHERHAM
YORKSHIRE

densation to occur in the underground pipes, while at other seasons there may be the reverse tendency, water being absorbed by the gas from the deposits which have occurred when the ground was relatively colder. These are the conditions under which dust may be produced, by the drying out of corrosion products, and surprisingly moderate gas velocities are sufficient to set up movement of the dust. Generally speaking, the gas velocities in the street mains are higher than those in the service pipes which are taken off, so that there is a tendency for dust which is on the move to be partly arrested at each individual service connection. It will also be seen that water vapour which has travelled from the works, or has been picked up en route, may again be condensed in the household pipes and fittings, and in this manner the gas meter itself may be found to suffer considerably. Whatever may be the excellence of construction of dry gas meters, and they have a high reputation for standing up to adverse conditions, the total cost of meter maintenance can be materially reduced by preventing such water condensation.

HROUGHOUT THE WORLD

W. C. **HOLMES** *& Co. Ltd.*

HUDDERSFIELD · LONDON · BIRMINGHAM

Tel.: Huddersfield 5280 · London, Victoria 9971 · Birmingham, Midland 6830

THIS is a medium temperature infra-red radiant heat burner for use on high pressure gas supplies only, say 3 to 5 lbs. per square inch, and it can be fitted to any type of oven or any travelling tunnel or stationary tunnel. A heat-resisting metal disc of about 4 inches diameter forms the radiant and operates at a bright red heat. The disc is mounted in a cast iron holder, and each holder is fed by its own high pressure injector. Gas consumption is about 20 cubic feet per hour.

THE illustrations show, at the top, both sides of the KEITH BLACKMAN Radiant Disc Burner, and at the bottom six of twelve burners applied to a paint drying oven.

Keith Blackman
RADIANT DISC
—GAS BURNER—

Price on application

KEITH BLACKMAN LTD., MILL MEAD ROAD, LONDON, N.17. TN: TOTTENHAM 4522. TA: "KEITHBLAC NORPHONE LONDON."
Branch Offices in Manchester, Birmingham, Leeds, Newcastle-on-Tyne, Glasgow, Penarth nr. Cardiff, and Belfast. Works: London and Arbroath.

JOINTS, GASKETS, WASHERS,
in RUBBER or ASBESTOS
CENTRAL MANFG., & TRADING CO. (DUDLEY) LTD.
OLD HILL STAFFS.
PHONE: CRADLEY HEATH 69181 (5 LINES).
"EVERYTHING IN ASBESTOS."

COMPRESSORS & EXHAUSTERS FOR AIR AND GAS.
See our Advertisement Next Week.
REAVELL & CO. LTD. IPSWICH.

J. BROWN & CO. LTD.
SAVILE TOWN, DEWSBURY, YORKS.
Supply:–
"BROWNOX-de-LUXE" PURIFYING MATERIAL
Purchase:–
SPENT OXIDE

SPECIALISTS in ERECTION, DISMANTLING, ETC.,
GAS PLANT, GASHOLDERS, PURIFIERS,
FACTORY BUILDINGS, SHEETING, GLAZING.
W.D. (SHEETERS) LTD.
BARCLAYS BANK CHAMBERS, OWEN STREET, TIPTON
Telephone: TIPTON 1958. STAFFS.

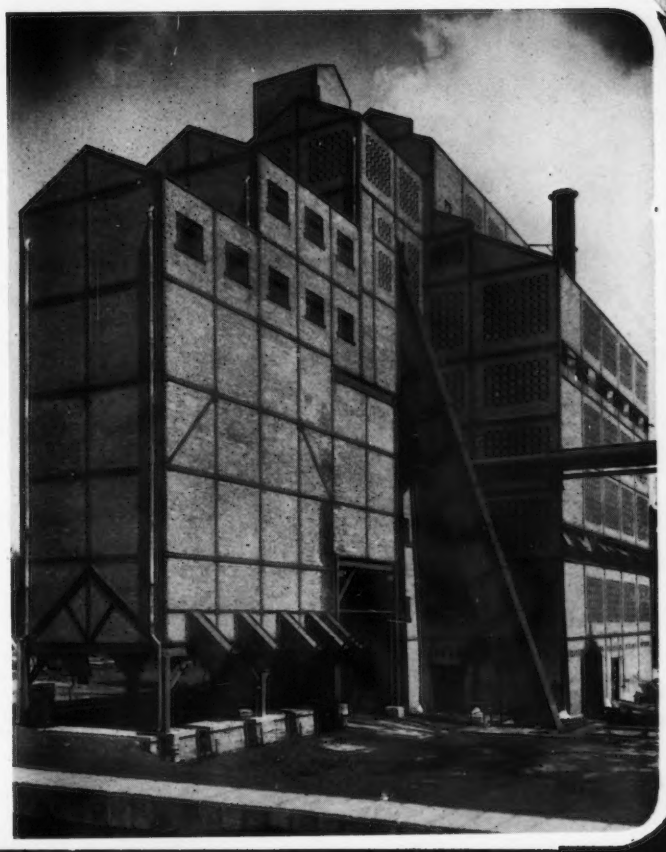
CONVEYORS,
ELEVATORS,
BUNKERS, ROOFS,
HOISTS, Etc.

GOODALL, CLAYTON & Co. LTD.
LEEDS.

COAL AND COKE SCREENING & SIZING PLANTS.
RETORT SETTINGS
PRODUCERS, FURNACES
REPAIRS.

Printed by STRAKER BROTHERS LTD., E.C.2, for WALTER KING, LIMITED, 11, BOLT COURT, FLEET STREET, LONDON, E.C.4. Wednesday, July 11, 1951

Work in progress



OX HILL, VICTORIA
AUSTRALIA

view of the Coke Plant end of
new Glover-West Retort House.

West's Gas
IMPROVEMENT CO., LTD.
MILES PLATTING, MANCHESTER, 10
Telephone: COLlyhurst 2961–5. Telegrams: Stoker, Manchester.
London Office: COLUMBIA HOUSE, ALDWYCH, W.C.2. Telephone: HOLborn 4108–9. Telegrams: Wesgasco, Estrand.

NEAT

SOLIDLY CONSTRUCTED

ECONOMICAL

GAS COOKING RINGS

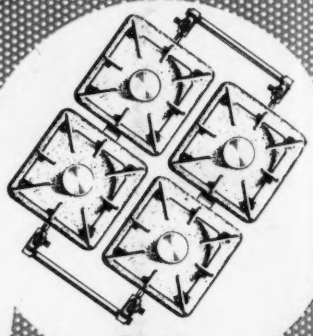
SINGLE POINT ADJUSTMENT

CANNOT LIGHT BACK

EFFICIENT

SILENT

FA/4



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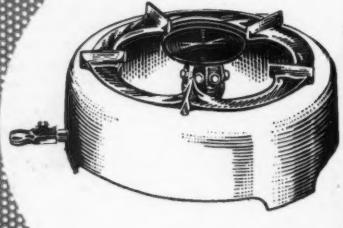

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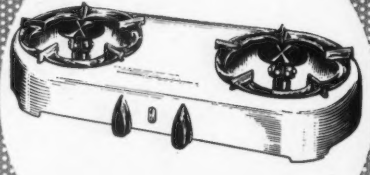

FA/2

All FA Neat gas cooking rings have an eight-jet burner which is silent, has single-point adjustment and cannot light back.

Hotplates FA/1 and FA/2
Pressed steel, vitreous enamelled in cream or grey. Detachable pan supports.

Unit burners FA/4
Can be used singly or in series with independent tap control for each. Sturdily constructed, easily dismantled for cleaning. Ideal for commercial and domestic use. Standard finish in grey vitreous enamel.

ASCOT

Manufacturers and sole distributors:

ASCOT GAS WATER HEATERS LIMITED

43 Park Street, London, W.1 Tel: Grosvenor 4491